description and utility

GRATE-X Grating is a heavy-duty expanded metal, produced from carbon steel sheet and plate. It contains no joints or welds; each sheet is a single piece of sturdy steel.

Structurally stronger than the original sheet, yet lightweight, GRATE-X Expanded Metal Grating is the ideal walkway and platform floor for light to heavy pedestrian loads. The Selection Guide on page 2 indicates the load/span combinations that may be accommodated with less than ¼" deflection considered the maximum deflection to afford pedestrian comfort. U.S.G. test data confirms that greater loads may be safely accommodated if the amount of deflection is not critical.

Low Cost—A cost-conscious engineer is always wary of overdesign. It is frequently more economical to build walkways and platforms with GRATE-X Grating than with other types of steel grating. Savings of up to 50% are not unusual. The reduction in dead weight, afforded by the use of GRATE-X Grating, is also a plus factor in design.

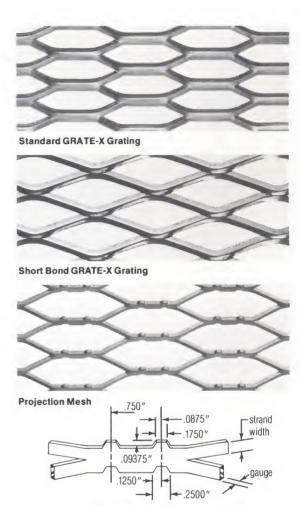
Safety—Most companies place safety ahead of all other aspects of plant operation. For this reason the plant engineer or plant designer is always looking for ways to improve safety performance of an installation. Grate-X Grating provides an excellent slip-resistant walking surface; helps meet OSHA requirements. Safe, sure footing is especially important above ground level.

The high percent of open area, characteristic of GRATE-X Grating, allows snow, water and oil to drain off easily, thus maintaining the slip-resistant surface. The open area also allows excellent passage of heat and light, and contributes to walkway cleanliness. Where maintenance and safety are important considerations, these features are outstanding.

Handling and Job Fabrication—Convenient sheet sizes and light weight make GRATE-X Grating a favorite of steel workers. Job cutting and fitting is simply done by one or two men with standard cutting and welding equipment. The convenient sheet sizes make it possible to move GRATE-X Grating into semi-finished structures for installation on walkways and platforms even though the roof of the structure has been completed.

Federal Specifications—GRATE-X Grating meets all requirements of Military Specifications MIL-M-17194C (Metal, Expanded, Steel) and MIL-G-18015A (Ships) (Gratings, Metal, other than Bar Type), and the deflection requirements of Federal Specification RR-G-1602A.





Enlarged Detail of Projection Mesh

types and functions

1. Carbon Steel GRATE-X Grating is manufactured in two patterns: Standard available in 3.0, 4.0, 5.0, 6.25 and 7.0-lb. styles; Short Bond available in 3.14 and 4.27-lb. styles. Custom Walkway Panels, 10' x 2', 2'6" or 3', are available in 3.0, 3.14, 4.0, 4.27 and 5.0-lb. styles to simplify application on catwalks and walkways. Flattened GRATE-X Grating has been cold-rolled to a smooth surface; available in four styles (see product data table).

2. Aluminum GRATE-X Grating is the same as Standard but is made from aluminum alloy 5052-H32. Available in 2.0-lb. style, it offers the combined advantages of aluminum and expanded metal grating. Specific advantages are:

Economy—Light weight and high strength per pound provide a highly economical open type metal flooring.

Corrosion Resistance—Offers excellent resistance to weathering and industrial atmospheres without painting.

Non-sparking, Non-magnetic, Non-toxic—Ideal for use in explosive atmospheres and food processing plants.

3. Carbon Steel Projection Mesh is a uniquely designed expanded metal with small tooth-like projections on the upper surface of the mesh. The projections provide an excellent non-slip surface. Available in 1.87 and 3.0-lb. styles suitable for light to moderate loads on spans of 6" to 24", it is excellent for industrial platforms, maintenance stands, and stair treads where maximum safety is required.

UNITED STATES GYPSUM

style	weight— ib. per	diamond size—in. (S.W.D.	opening size—in.	strand size—in. (width x	depth-	percent open	standard sheet size—ft.
designation			(S.W.O. x L.W.O.)	(width x thickness)	inches	open area	width (S.W.D.) x length (L.W.D.)
Carbon Stee	el GRATE-X Gr	ating					
3.0 lb.*	300	1.33 x 5.33	.95 x 3.50	.264 x .183	9/16	60	4 x 8, 6 x 8, 4 x 10, 5 x 10, 6 x 10, 4 x 12, 6 x 12, 10 x 6
3.14 lb.*	314	2.00 x 6.00	1.63 x 4.88	.312 x .250	11/16	69	4 x 8, 4 x 10, 6 x 10, 10 x 6
4.0 lb.*	400	1.33 x 5.33	.83 x 3.30	.300 x .215	5/8	62	4 x 8, 5 x 8, 6 x 8, 4 x 10, 5 x 10, 6 x 10, 10 x 6
4.27 lb.*	427	1.41 x 4.00	1.00 x 2.88	.300 x .250	5/B .	58	4 x 8, 6 x 8, 4 x 10, 6 x 10, 10 x 6
5.0 lb.*	500	1.33 x 5.33	.76 x 3.20	.331 x .250	11/16	57	4 x 8, 5 x 8, 6 x 8, 4 x 10, 5 x 10, 6 x 10, 10 x 6
6.25 lb.	625	1.41 x 5.33	.75 x 3.10	.350 x .312	3/4	53	4 x 8, 6 x 8, 4 x 10, 6 x 10
7.0 lb.	700	1.41 x 5.33	.69 x 3.05	.391 x .312	3/4	49	4 x 8, 4 x 10
Carbon Stee	I Flattened GR	ATE-X Grating	9				
2.8 lb.	280	1.33 x 5.67	.81 x 4.00	.285 x .160	.160	55	4 x 8
2.95 lb.	295	2.00 x 6.38	1.31 x 5.50	.340 x .220	.220	64	4 x 10
3.75 lb.	375	1.33 x 5.67	.81 x 4.00	.320 x .190	.190	50	4 x 8
4.02 lb.	402	1.41 x 4.25	.75 x 3.50	.315 x .210	.210	53	4 x 8
Aluminum G	RATE-X Gratin	ng—Type 5052	2				
2.0 lb.	200	1.33 x 5.33	.61 x 3.20	.387 x .250	3/4	46	4 x 8, 5 x 10, 6 x 12
Carbon Stee	Projection Me	esh					
1.87 lb.	187	1.13 x 5.00	.88 x 3.19	.187 x .134	7/16	67	4 x 8'4", 6 x 10
3.0 lb.	300	1.13 x 5.00	.75 x 3.12	.250 x .164	5/8	56	6 x 8'4"

^{*}Also available 10' S.W.D. x 2', 2'6", 3' L.W.D.

selection guide

Determine clear span and loading, then select appropriate style of GRATE-X Grating from tables below. Style shown will provide 1/4" maximum deflection recommended for normal pedestrian comfort

with a safety factor of either 3/3 proportionate limit or 1/2 ultimate load, whichever is less. Data based on tests conducted by U.S.G. Research Center.

concentrated loading

concentrated load (lb. per	clear span										
oot of width)	18"	24"	30"	36"	42"	48"	54"	60"	66"	72	
50	3.0 3.14	3.0 3.14	3.0 3.14	3.0 3.14	3.0 3.14	4.0 4.27	5.0 6.25	6.25 7.0	6.25 7.0	7.0	
100	3.0 3.14	3.0 3.14	3.0 3.14	3.0 3.14	4.0 4.27	5.0 6.25	7.0				
150	3.0 3.14	3.0 3.14	3.0 3.14	5.0 6.25	5.0 6.25	7.0	7.0				
200	3.0 3.14	3.0 3.14	4.0 4.27	5.0 6.25	6.25 7.0	7.0					
250	3.0 3.14	3.0 3.14	4.0 4.27	6.25 7.0	7.0						
300	3.0 3.14	4.0 4.27	5.0 6.25	7.0							
350	3.0 3.14	4.0 4.27	6.25 7.0	7.0							
400	3.0 3.14	4.0 4.27	6.25 7.0								

Aluminum GRATE-X Grating

concentrated load (lb. per foot of width)	clear span							
	12"	18"	24"	30"	36"			
50	2.0	2.0	2.0	2.0	2.0			
100	2.0	2.0	2.0	2.0	2.0			
150	2.0	2.0	2.0	2.0				
200	2.0	2.0	2.0					

Carbon Steel Projection Mesh

50	1.87	1.87	1.87	3.0	3.0	
100	1.87	1.87	3.0	3.0		
150	1.87	1.87	3.0			
200	1.87	3.0				

uniform loading

uniform load (lb.	clear span								
per sq. ft.)	24"	30"	36"	42"	48"				
50	3.0 3.14	3.0 3.14	3.0 3.14	4.0 5.0	6.25 7.0				
100	3.0 3.14	3.0 3.14	5.0 6.25	7.0					
150	3.0 3.14	4.0 5.0	6.25 7.0						
200	3.0 3.14	5.0 6.25	6.25						
250	3.0 3.14	6.25 7.0	6.25						
300	4.0 4.27	6.25 7.0							
350	5.0	7.0							
400	5.0								

Aluminum GRATE-X Grating

uniform ioad (lb.	clear span								
per sq. ft.)	12"	18"	24"	30"	36				
50	2.0	2.0	2.0	2.0	2.0				
100	2.0	2.0	2.0	2.0	2.0				
150	2.0	2.0	2.0						
200	2.0	2.0	2.0						

Carbon Steel Projection Mesh

50	1.87	1.87	1.87	3.0	
100	1.87	1.87	1.87	3.0	
150	1.87	1.87	3.0		
200	1.87	1.87	3.0		

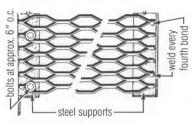
GRATE-X Expanded Metal Grating SA-505

installation recommendations

- 1. Grate-X Grating has a "top" and "bottom" side, as shown in Diagram 5, below and should be installed with the straight edge up for greater surface contact.
- 2. The slope of the bonds (see Diagram 4) should always be in the same direction on a given platform or walkway for neatness and uniformity.
- 3. Grate-X Grating should always be placed so that the long direction of the diamond openings is perpendicular to structural supports, and the ends should always bear on, and be fastened to, structural sup-

ports as in Diagrams 1 and 2. Fastening may be by welding or bolting every fourth bond, or approximately every 6".

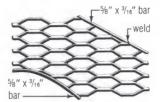
- **4.** The sides of adjacent sheets do not require structural supports when welded as in Diagrams 6 and 7.
- 5. All diagonal or circular cut exposed edges should be banded with a bar roughly equal to the over-all grating thickness, welded at contact points. See Diagram 3.
- **6.** Diagram 8 illustrates the recommended method for covering cutouts with a separate piece of grating.



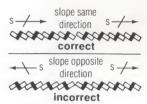
method of attaching to supports



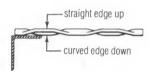
covering over trenches, etc.



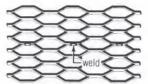
3. banding at diagonal/circular cuts



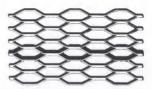
4. direction of placement



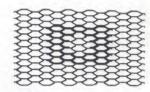
5. top & bottom sides



6. join sheets by butting & welding



7. join sheets by lapping & welding



8. covering cutouts

U.S.G. project fabrication service

For installations where stock size sheets cannot be used, United States Gypsum estimates, quotes, details and fabricates to your requirements; supplies Grate-X Grating with banding and toe plates installed where needed; applies rust-preventive primer or furnishes hot-dip galvanizing on request . . . welds tags to every section of grating for easy identification to prevent errors. This service is available through your U.S.G. distributor.

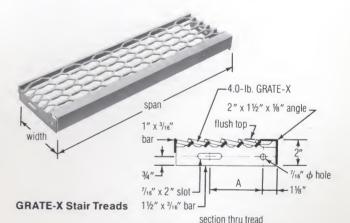
stair treads

Fabricated from Grate-X Grating and simple steel sections, U.S.G. Stair Treads are strong, durable, and provide a safe, sure footing. They are self-cleaning and easily maintained. Ideal for industrial stairs, either interior or exterior; quickly installed by simple attachment with bolts and nuts to standard channel stringers. Shipped completely fabricated, primed and ready to install. Attachment bolts not furnished.

Stair treads are available in popular sizes or produced to order in ½" length increments up to and including 48". Manufactured in two types:

GRATE-X Stair Treads—sturdy welded assembly available with abrasive or checkerplate nosing on special order. Sizes available on order: 81/4"x24", 81/4"x30", 95/4"x30", 95/4"x36".

TREAD-X™ Stair Treads—unique design provides economically priced tread. Sizes available on order: 8½"x24", 8½"x30", 9¾"x30", 9¾"x36". Also available with serrated front bar.



4.0-Ib. GRATE-X
2" x ³/₁ε" continuous bar (smooth or serrated nosing)

flush top

y/½"

γ/₁ε" φ hole

7/16" x 2" slot

TREAD-X Stair Treads

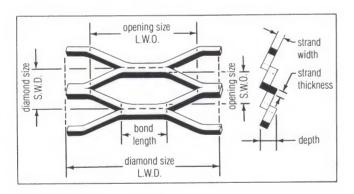
section thru tread

	weight in lb.	
dimension "A"	base	per 1"
21/2"	.90	.32
21/2"	1.12	.36
41/2"	1.30	.38
6"	1.53	.42
7"	1.75	.46
3"	1.11	.26
3"	1.39	.30
5¾"	1.60	.33
5¾"	1.90	.37
8"	2.15	.41
	2½" 2½" 4½" 6" 7" 3" 3" 5¾"	dimension "A" base 2½" .90 2½" 1.12 4½" 1.30 6" 1.53 7" 1.75 3" 1.11 3" 1.39 5¾" 1.60 5¾" 1.90

safe concentrated loads(1)-Ib.

length	GRATE-X tread	TREAD-X tread		
24"	780			
30"	625	480		
36"	520	400		
42"	445	340		
48"	390	300		

(1) Load limits are approximately the same for treads of the same length, regardless of width.



specifications

scope—Grate-X Expanded Metal Grating shall be installed for all walkways and other areas where shown on drawings.

material—GRATE-X Expanded Metal Grating shall weigh (specify weight per sq. ft. from table, page 2).

(For steel) The steel used in manufacture shall comply with ASTM A283-75

(For aluminum) The aluminum used in manufacture shall be 5052-H32 alloy and comply with ASTM B209.

erection—Units of Grate-X Grating shall be installed with straight edge of bond up and shall be placed that the direction of the long way of the diamond parallels the direction of the span. Attachment to framing shall be by welding or bolting at 6" intervals. Edges parallel to long way of diamonds shall be butted and welded on every second bond. Individual pieces of grating shall be placed so that diamonds of one piece are aligned with those of adjacent pieces.

ordering information

- 1. Order from your local U.S.G. Expanded Metal Distributor.
- 2. Always specify the amount, style and sheet size, as in the following examples:

20 pcs., 5.0-lb. GRATE-X, 4' x 8' 5 pcs., 2.0-lb. Alum. GRATE-X, 5' x 10'

Note: The sheet size S.W.D. (short way of diamond) is always specified and the sheet size L.W.D. (long way of diamond) is specified second, i.e., S.W.D. x

3. If special sheet sizes are required, state exact sheet size and type of shearing wanted, or dimensional tolerance allowed. GRATE-X Grating is normally furnished bond-sheared on the first bond over the specified dimension (both S.W.D. and L.W.D.); however, it can be furnished random-sheared to a closer tolerance if required.

Standard tolerances on special sheet sizes are as follows:

Bond Sheared Sheets-0", +1/2 diamond

Random Sheared Sheets ± 1/8"

- **4.** If your Grate-X Grating requirements involve walkways and platform areas that cannot be specified in simple sheet sizes, contact your U.S.G. Sales Representative for assistance.
- 5. For technical assistance or more information, call toll-free (800) 621-7789; in Illinois, call (312) 321-5856.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAM-AGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

description and utility

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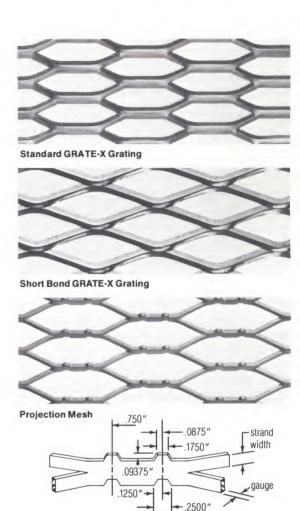
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Enlarged Detail of Projection Mesh

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Corrosion Resistance—Offers excellent resistance to weathering and industrial atmospheres without painting.

Non-sparking, Non-magnetic, Non-toxic—Ideal for use in explosive atmospheres and food processing plants.

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	weight-	diamond size—in.	opening size—in.	strand size—in.	denth-	percent	standard sheet size—ft.
style designation			(S.W.O. x L.W.O.)	(width x thickness)	depth— inches	open area	width (S.W.D.) x length (L.W.D.)
Carbon Stee	el GRATE-X Gr	ating					
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4.02 lb.	402	1.41 x 4.25	.75 x 3.50	.315 x .210	.210	53	4 x 8
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3.0 lb.	300	1.13 x 5.00	.75 x 3.12	.250 x .164	5/B	56	6 x 8'4"

^{*}Also available 10' S.W.D. x 2', 2'6", 3' L.W.D.

selection guide

Determine clear span and loading, then select appropriate style of GRATE-X Grating from tables below. Style shown will provide 1/4" maximum deflection recommended for normal pedestrian comfort with a safety factor of either $\frac{2}{3}$ proportionate limit or $\frac{1}{2}$ ultimate load, whichever is less. Data based on tests conducted by U.S.G. Research

concentrated loading

concentrated load (lb. per foot of width)	clear span										
	18"	24"	30″	36"	42"	48"	54"	60"	66"	72″	
50	3.0 3.14	3.0 3.14	3.0 3.14	3.0 3.14	3.0 3.14	4.0 4.27	5.0 6.25	6.25 7.0	6.25 7.0	7.0	
100	3.0 3.14	3.0 3.14	3.0 3.14	3.0 3.14	4.0 4.27	5.0 6.25	7.0				
150	3.0 3.14	3.0 3.14	3.0 3.14	5.0 6.25	5.0 6.25	7.0	7.0				
200	3.0 3.14	3.0 3.14	4.0 4.27	5.0 6.25	6.25 7.0	7.0					
250	3.0 3.14	3.0 3.14	4.0 4.27	6.25 7.0	7.0						
300	3.0 3.14	4.0 4.27	5.0 6.25	7.0							
350	3.0 3.14	4.0 4.27	6.25 7.0	7.0							
400	3.0 3.14	4.0 4.27	6.25 7.0								

Aluminum GRATE-X Grating

concentrated	clear span							
load (lb. per foot of width)	12"	18"	24"	30"	36"			
50	2.0	2.0	2.0	2.0	2.0			
100	2.0	2.0	2.0	2.0	2.0			
150	2.0	2.0	2.0	2.0				
200	2.0	2.0	2.0					

Carbon Steel Projection Mesh

50	1.87	1.87	1.87	3.0	3.0	
100	1.87	1.87	3.0	3.0		
150	1.87	1.87	3.0			
200	1.87	3.0				

uniform loading

Carbon Ste	el GRAT	E-X Gr	ating						
uniform	clear span								
load (lb. per sq. ft.)	24"	30"	36"	42"	48"				
50	3.0 3.14	3.0 3.14	3.0 3.14	4.0 5.0	6.25 7.0				
100	3.0 3.14	3.0 3.14	5.0 6.25	7.0					
150	3.0 3.14	4.0 5.0	6.25 7.0						
200	3.0 3.14	5.0 6.25	6.25						
250	3.0 3.14	6.25 7.0	6.25						
300	4.0 4.27	6.25 7.0							
350	5.0	7.0							
400	5.0								

Aluminum GRATE-X Grating

uniform	clear span							
load (lb. per sq. ft.)	12"	18"	24"	30"	36"			
50	2.0	2.0	2.0	2.0	2.0			
100	2.0	2.0	2.0	2.0	2.0			
150	2.0	2.0	2.0					
200	2.0	2.0	2.0					

Carbon Steel Projection Mesh

50	1.87	1.87	1.87	3.0	
100	1.87	1.87	1.87	3.0	
150	1.87	1.87	3.0		
200	1.87	1.87	3.0		

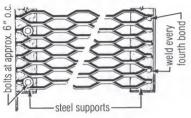
GRATE-X Expanded Metal Grating SA-505

installation recommendations

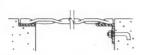
- 1. GRATE-X Grating has a "top" and "bottom" side, as shown in Diagram 5, below and should be installed with the straight edge up for greater surface contact.
- 2. The slope of the bonds (see Diagram 4) should always be in the same direction on a given platform or walkway for neatness and
- 3. GRATE-X Grating should always be placed so that the long direction of the diamond openings is perpendicular to structural supports, and the ends should always bear on, and be fastened to, structural sup-

ports as in Diagrams 1 and 2. Fastening may be by welding or bolting every fourth bond, or approximately every 6".

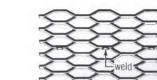
- 4. The sides of adjacent sheets do not require structural supports when welded as in Diagrams 6 and 7.
- 5. All diagonal or circular cut exposed edges should be banded with a bar roughly equal to the over-all grating thickness, welded at contact points. See Diagram 3.
- 6. Diagram 8 illustrates the recommended method for covering cutouts with a separate piece of grating.



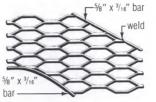
1. method of attaching to supports



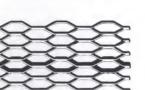
2. covering over trenches, etc.



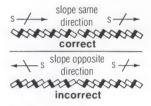
6. join sheets by butting & welding



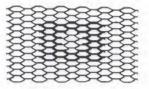
3. banding at diagonal/circular cuts



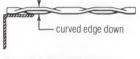
7. join sheets by lapping & welding



4. direction of placement



8. covering cutouts



straight edge up

5. top & bottom sides



For installations where stock size sheets cannot be used, United States Gypsum estimates, quotes, details and fabricates to your requirements; supplies GRATE-X Grating with banding and toe plates installed where needed; applies rust-preventive primer or furnishes hot-dip galvanizing on request ... welds tags to every section of grating for easy identification to prevent errors. This service is available through your U.S.G. distributor.

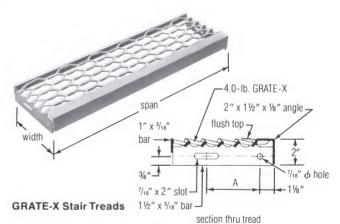
stair treads

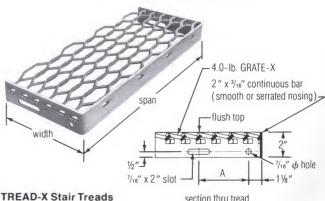
Fabricated from GRATE-X Grating and simple steel sections, U.S.G. Stair Treads are strong, durable, and provide a safe, sure footing. They are self-cleaning and easily maintained. Ideal for industrial stairs, either interior or exterior; quickly installed by simple attachment with bolts and nuts to standard channel stringers. Shipped completely fabricated, primed and ready to install. Attachment bolts not furnished.

Stair treads are available in popular sizes or produced to order in 1/2" length increments up to and including 48". Manufactured in two types:

GRATE-X Stair Treads—sturdy welded assembly available with abrasive or checkerplate nosing on special order. Sizes available on order: 81/4"x24", 81/4"x30", 95/8"x30", 95/8"x36".

TREAD-X" Stair Treads—unique design provides economically priced tread. Sizes available on order: 81/2"x24", 81/2"x30", 93/4"x30", 93/4"x36". Also available with serrated front bar.





section thru tread

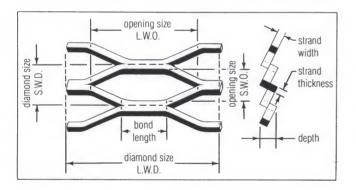
stair tread product data

		weight in lb	
width	dimension "A"	base	per 1"
GRATE-X tread			
5%"	21/2"	.90	.32
7"	21/2"	1.12	.36
81/4"	41/2"	1.30	.38
9%"	6"	1.53	.42
11"	7″	1.75	.46
TREAD-X tread			
5¾"	3″	1.11	.26
71/8"	3″	1.39	.30
81/2"	5¾"	1.60	.33
9¾"	5¾"	1.90	.37
111/4"	8"	2.15	.41

safe concentrated loads(1)--- lb.

length	GRATE-X tread	TREAD-X tread
24"	780	600
30"	625	480
36"	520	400
42"	445	340
48"	390	300

(1) Load limits are approximately the same for treads of the same length, regardless of width.



specifications

scope-Grate-X Expanded Metal Grating shall be installed for all walkways and other areas where shown on drawings.

material-GRATE-X Expanded Metal Grating shall weigh (specify weight per sq. ft. from table, page 2).

(For steel) The steel used in manufacture shall comply with ASTM A283-75.

(For aluminum) The aluminum used in manufacture shall be 5052-H32 alloy and comply with ASTM B209.

erection—Units of GRATE-X Grating shall be installed with straight edge of bond up and shall be placed that the direction of the long way of the diamond parallels the direction of the span. Attachment to framing shall be by welding or bolting at 6" intervals. Edges parallel to long way of diamonds shall be butted and welded on every second bond. Individual pieces of grating shall be placed so that diamonds of one piece are aligned with those of adjacent pieces.

ordering information

- 1. Order from your local U.S.G. Expanded Metal Distributor.
- 2. Always specify the amount, style and sheet size, as in the following examples:

20 pcs., 5.0-lb. GRATE-X, 4' x 8'

5 pcs., 2.0-lb. Alum. GRATE-X, 5' x 10'

Note: The sheet size S.W.D. (short way of diamond) is always specified and the sheet size L.W.D. (long way of diamond) is specified second, i.e., S.W.D. x

3. If special sheet sizes are required, state exact sheet size and type of shearing wanted, or dimensional tolerance allowed. GRATE-X Grating is normally furnished bond-sheared on the first bond over the specified dimension (both S.W.D. and L.W.D.); however, it can be furnished random-sheared to a closer tolerance if required.

Standard tolerances on special sheet sizes are as follows:

Bond Sheared Sheets-0", +1/2 diamond

Random Sheared Sheets ± 1/81

- 4. If your GRATE-X Grating requirements involve walkways and platform areas that cannot be specified in simple sheet sizes, contact your U.S.G. Sales Representative for assistance.
- 5. For technical assistance or more information, call toll-free (800) 621-7789; in Illinois, call (312) 321-5856.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAM-AGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.



description and utility

GRIP STRUT Safety Grating has been engineered to provide maximum safety underfoot, exceptional load-carrying capacity, and lightweight, self-framing, one-piece construction. Now available, new heavy-duty type GRIP STRUT Safety Grating has all features of the regular product plus added load-carrying capacity and longer service life. GRIP STRUT Grating helps meet OSHA standards for walking-working surfaces and is ideally suited for all types of work platforms, open flooring, catwalks, balconies, storage areas, walkways and stair treads. It has been used extensively by the transportation, pulp and paper, chemical, mining, food processing, waste and sewage treatment and oil industries for these and other applications. Also highly suited for renovating worn concrete, checker plate and bar grating floors to provide a non-slip surface.

GRIP STRUT Grating has reticulated and formed metal cross struts arranged in a diamond pattern with integrally formed channels at the edges. The cross struts form a slip-resistant, resilient walking surface with sufficient open area to provide ample passage of light and air. Other features:

High Strength—lightweight, one-piece construction develops strength from the section and a high load capacity per pound. Some styles are suitable for spans up to 12 ft.

Safety Surface—the unique surface pattern makes GRIP STRUT Safety Grating slip-resistant in all directions. Both types meet anti-slip values set forth in Fed. Spec. RR-G-1602A.

Easily Installed—most sections can be handled by one man. Cuts readily—is rapidly welded, bolted or clamped into place.

Large Open Area—permits free flow of air, heat and light. Often eliminates need for extra sprinklers under catwalks and platforms.

Economical—low in initial cost. Quickly installed, self-cleaning. Standard galvanized or hot-dip galvanized finish minimizes maintenance. Plain finish is easily painted for low maintenance costs. Light weight with high strength can result in structural steel savings.

types and functions

GRIP STRUT Gratings are manufactured in regular and heavy-duty types and in various channel depths and gauges to accommodate design loads needed for pedestrian traffic or those encountered in light storage or equipment installations. GRIP STRUT Grating is produced in galvanized steel, carbon steel, aluminum and stainless steel to meet corrosion-resistance requirements, provide long-lasting service and low life-cycle costs. GRIP STRUT Grating products include:

1. GRIP STRUT Safety Grating has a highly slip-resistant serrated surface for use where safety underfoot is a prime requirement. The

face for use where safety underfoot is a prime requirement. The regular type comes in widths from 4¾ to 24-in. and lengths up to 14 ft. The heavy-duty type is made in 9¼, 13¾, 27% and 36-in. widths, 10 and 12-ft. standard lengths. Also available with flat metal both sides of matrix for fabrication to suit requirements and in regular type, with specially formed sides for use in reconditioning floors and stairs.

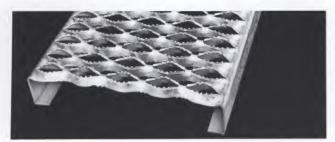
2. GRIP STRUT Safety Grating Walkway, with integral Z-flanges, meets OSHA requirements for toeboards on elevated runways. The high flanges help prevent tools and parts from falling over the edges and make the grating ideal for conveyor walkways on spans up to 12 ft. This exceptionally strong walkway material is produced in two types: regular in 24-in. widths with 4½-in. high flanges; heavy-duty in 30 and 36-in. widths in steel and 27% width in aluminum, both with 5-in. high flanges.



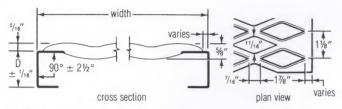
12-gauge GRIP STRUT Grating—heaviest available until now.



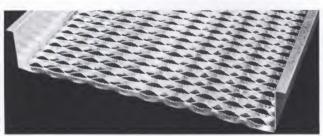
New 9-gauge GRIP STRUT Grating readily handles the tough jobs.



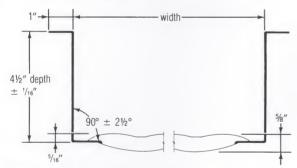
GRIP STRUT Safety Grating



safety or non-serrated grating



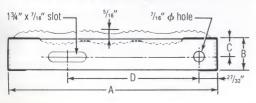
GRIP STRUT Safety Grating Walkway



safety grating walkway



GRIP STRUT Safety Grating Stair Tread



dimensions A, B, C, & D have a tolerance ± 1/16"

treads available in safety edge as shown, or in intermediate type

- **3. GRIP STRUT Safety Grating Stair Treads** are ready-to-install units fabricated from GRIP STRUT Safety Grating. Treads of regular grating are available with standard nosing in 4¾, 7, 9½ and 11¾-in. widths and with abrasive nosing in 8½ and 10½-in. widths. Heavy duty treads are 9¼-in. wide. Standard lengths: 24, 30, 36 and 48 in.; special lengths available on order.
- **4. Grip Strut Non-serrated Grating** provides a high-strength, lightweight, all purpose pedestrian traffic way, platform or storage deck.

product data—regular grating

available metals and finishes

- a. galvanized steel—hot-dip galvanized before fabrication, ASTM A525, standard; also available hot-dip galvanized after fabrication on special order. With pregalvanized sheets, cut edges are protected by the electrochemical action of the zinc.
- b. carbon steel-hot rolled, pickled and oiled.
- c. stainless steel—alloy type 304, 2D finish; alloy type 316L, 2B finish. These alloys offer excellent corrosion resistance, high strength and good weldability.
- **d. aluminum**—alloy 5052-H32, mill finish, lightly oiled. In addition to light weight, this alloy offers strength and corrosion resistance.

grating lengths-10 and 12 ft. in all materials and sizes.

grating-styles available

	gauge	weigh	t—lb. pe	r lin. ft.			
channel height(2)	& type	43/4"	7"	91/2"	11¾"	18¾″	24"
1½" 2' 21½" 3'' 4½" walkway	14-ga. steel	2.3 2.6 2.8 —	3.0 3.2 3.5 —	3.6 3.8 4.1	4.2 4.4 4.7 —	6.1 6.3 6.6 —	7.4 - 7.9 8.9
1½" 2" 2½" 3" 4½" walkway	12-ga. steel	3.2 3.6 4.0 —	4.1 4.5 4.9 5.2	5.0 5.4 5.7 6.1	5.9 6.2 6.6 7.0	8.5 8.9 9.2 9.6	10.4 11.1 12.5
2'	12-ga.(.080') aluminum(1)	0.9	1.2	1.4	1.6	_	_
2'	10-ga.(.100') aluminum(1)	1.2	1.5	1.7	2.0	2.8	_
2"	16-ga.stls.stl. types 304 & 316L	-	_	3.2	3.7	_	_

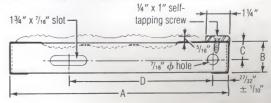
(1)11/2", 21/2" and 3" channel heights available on special order. (2) Add 5/16" for overall depth.

stair tread-styles available

standard	d			with abra	with abrasive nosing				
A	В	С	D	A	В	С	D		
4¾" (2 dia.)	1½" 2"	3/4" 1"		_	-	_	_		
7" (3 dia.)	1½" 2"	3/4" 1"	3¾" 3¾"	81/8" (3 dia.)	1½" 2"	3/4" 1"	4½" 4½"		
9½" (4 dia.)	1½" 2"	3/4" 1"	57/8" 57/8"	10½" (4 dia.)	1½" 2"	3/4" 1"	67/8" 67/8"		
11¾" (5 dia.)	1½" 2"	3/4" 1"	8½" 8½"	_	-	_	_		

Length tolerance: $\pm 1\!/\!_{8}{}''.$ For key to dimensions, see drawings below.

Abrasive Nosing GRIP STRUT Safety Grating Stair Tread



product data—heavy duty grating

available metals and finishes

- a. galvanized steel—hot-dip galvanized before fabrication, ASTM A525, standard; also available hot-dip galvanized after fabrication on special order.
- b. carbon steel-unpainted, hot rolled, pickled and oiled.
- c. aluminum-alloy 5052-H32, mill finish lightly oiled.

grating lengths—10 and 12 ft. in all materials and sizes.

grating-styles available

	gauge	weight	—lb. per li	in. ft.		
channel height(1)	& type	91/4"	13¾"	275%"	30"	36"
2" 2½" 3" 4"	11-ga. steel	6.6 7.0 7.5 8.3	8.5 8.9 9.3 10.1			=
2" 2½" 3" 4" 5" walkway	10-ga. steel	7.4 7.9 8.4 9.3	9.5 10.0 10.5 11.4			19.9 20.4 20.9 21.8 22.7
2" 2½" 3" 4" 5" walkway	9-ga. steel	8.3 8.8 9.3 10.3	10.6 11.1 11.6 12.7	=		22.1 22.7 23.2 24.2 25.3
2" 2½" 3" 4"	.150" aluminum	2.6 2.8 3.0 3.3	3.4 3.6 3.8 4.1	5.8 6.0 6.2 6.5	=	=
5" walkway	.160" aluminum	-	_	6.8	_	_

(1)Add $^{21}/_{32}$ " for overall depth.

stair treads

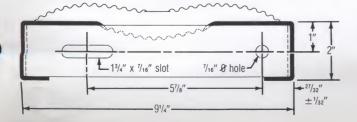
Stair treads are available made from 10 ga. steel and .150" aluminum grating with 2" channel in 91/4" width; 24", 30", 36" and 48" length.

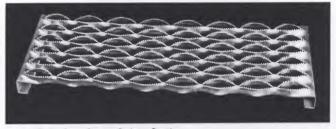
fabrication service

On large jobs, United States Gypsum estimates, quotes, details and fabricates to your requirements. Lump-sum quotations are made from submitted plans and specifications. After receipt of order, a bill of materials and necessary layout drawings are prepared. Grating is supplied with special cutting, banding and toe plates installed where needed. This fabrication service is available through your GRIP STRUT Grating distributor.

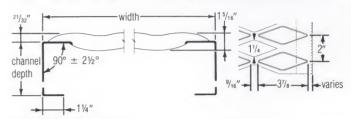


Heavy Duty GRIP STRUT Grating Stair Tread

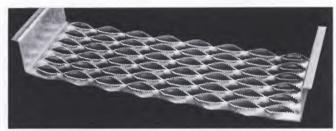




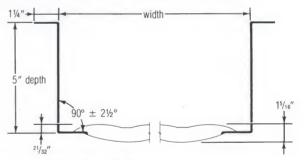
Heavy Duty GRIP STRUT Safety Grating



heavy duty safety grating



Heavy Duty GRIP STRUT Safety Grating Walkway



heavy duty safety grating walkway

specifications—notes to architect

- 1. These specifications are presented as a general guide to the architect or structural engineer in preparing project specifications. Allowable loads, spans and other limiting conditions presented in this folder offer product data for use in design and construction. These products must not be used without prior structural design by a qualified engineer or architect.
- 2. Supports should provide a smooth, level 1½" minimum bearing surface, free of burrs, bridging, welds or other irregularities.
- **3. Banding**–random cut ends and diagonal or circular cut exposed edges should be banded with a bar at least ¼" thick and equal to the overall grating thickness welded at contact points.
- **4. Bolted connections**, except stair or ladder tread attachment to stringer channels, may be replaced by welded connections that develop the same strength.
- 5. Design Aids—miniature "Specifications Drawings" of GRIP STRUT Grating Products, G-413, and "Design Drawings for Stair Systems", G-404, are available, at no cost, for use in design and drawing preparation. Also available, U.S.G. folder "OSHA Standards for Walking-

Working Surfaces", G-583, to help designers comply with these regulations. Ask your GRIP STRUT Grating Distributor for them.

Part 1: general

1.1 scope

The contractor shall furnish and install GRIP STRUT Grating and Stair Treads, as specified, in all areas where shown on the drawings.

1.2 qualifications

All GRIP STRUT Grating, Stair Treads and accessories, unless otherwise indicated, shall be manufactured by Metal Products Division, United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 submittals

The contractor shall furnish shop drawings of grating layout, framing and supports, unit dimensions and sections, type and location of fasteners and welds

1.4 storage and handling

All materials shall be stored and handled to avoid damage. Damage or deteriorated materials shall be removed from the premises.

Part 2: products

2.1 grating materials

- a. Type: (Regular) (Heavy Duty) (GRIP STRUT Safety Grating) (GRIP STRUT Safety Grating Walkway).
- b. Metal and Finish: (select from pages 2 and 3).
- c. Metal gauge: Regular [(14-ga.)(12-ga.) steel] [16-ga. stainless steel] [(.080')(.100') aluminum]; Heavy Duty [(11-ga.)(10-ga.)(9-ga.) steel] (.150')(.160') aluminum].
- d. Section width: Regular, (4¾")(7")(9½")(11¾")(18¾")(24") Heavy Duty, (91/4")(133/4")(275/8")(36").
- e. Channel depth: Regular (11/2")(2")(21/2"), Heavy Duty (2")(21/2") (3")(4"), Regular Walkway—41/2", Heavy Duty Walkway—5".

2.2 stair tread materials

- a. Type: (Regular) (Heavy Duty) GRIP STRUT Safety Grating Tread (with Abrasive Nosing).
- b. Metal and Finish: (select from pages 2 and 3).
- c. Tread depth: Regular, (2 dia. 43/4" wide) (3 dia. 7" wide) (4 dia. 91/2" wide) (5 dia. 113/4" wide); Heavy Duty (2 dia. 91/4" wide).
- d. Channel height: (11/2") (2").
- e. Gauge: Regular, (14-ga. steel) (12-ga. steel) (16-ga. stainless steel) (.080" aluminum) (.100" aluminum); Heavy Duty, (10-ga. steel) (.150" aluminum)
- f. Span or width of staircase: (24") (30") (36") (48").

2.3 accessories (regular grating)

- a. Anchor and Clamp Assembly: electrogalvanized with (11/2")(2") (21/2") (3") J-bolts, nuts, washers.
- b. GRIP STRUT Anchoring Device: mill-galvanized (use with 5/16" carriage bolts, nuts, washers obtained locally).
- c. GRIP STRUT Splice Plate: (7", 10-ga. mill-galvanized) (30", 12-ga. mill galvanized) with bolts, hex nuts, washers.

Part 3: execution

3.1 condition of surfaces

Prior to grating installation, contractor shall inspect supports for correct size, layout, alignment and verify that surfaces to receive grating are free of debris. Contractor shall report to architect or owner's agent in writing any defects considered detrimental to proper application of grating so defects can be remedied before grating is applied.

3.2 grating installation

Install grating in accordance with manufacturer's recommendations and shop drawings. Position grating sections flat and square with ends bearing min. 11/2" on supporting structure. Keep grating sections at least 1/4" away from vertical steel sections and 1/2" from concrete walls. Allow clearance at joints between grating sections of max. 1/4" at side channels and max. 3/8" at ends. When specified, band random cut ends and diagonal or circular cut exposed edges with a min. 1/8" thick bar welded at contact points.

Join abutting ends of walkway sections with GRIP STRUT Splice Plates bolted to outside of side rails or welded as specified.

3.3 grating attachment

Attach grating to supports without warp or deflection as follows:

- a. Single plank application-Secure plank ends to supporting members at every point of contact. Use two GRIP STRUT Anchoring Devices and 5/16" carriage bolts and nuts at each end or secure side channel ends to supports with 1/8" fillet welds, 1" long.
- b. Multiple plank application—Secure perimeter plank to supporting members at every point of contact and intermediate grating sections with at least one attachment each end of plank, on alternate sides. For added rigidity when span exceeds (6'-0") (8'-0"), attach side channels of adjacent plank together at mid-point of span.
- 1. Welded attachment—Secure side channels to supports by fusion welding with 1/8" fillet welds, 1" long. Weld planks together with 1/8" fillet welds, 1" long spaced 24" o.c. and staggered top and bottom
- 2. Clamp attachment—Secure intermediate planks to supports using anchor and clamp assembly. Use GRIP STRUT Anchoring Device with 5/16" carriage bolts and nuts for securing perimeter planks. Fasten adjacent side rails together with 3/8" machine bolts and nuts.
- 3. Bolt attachment-Secure plank to supports with GRIP STRUT Anchoring Device and 5/16" carriage bolts and nuts. Fasten adjacent side rails together with 3/8" machine bolts and nuts.

3.4 stair tread installation

Install GRIP STRUT Stair Treads shown on the drawings or as herein specified. Fasten treads to stair stringers with %" x 1" machine bolts and nuts.

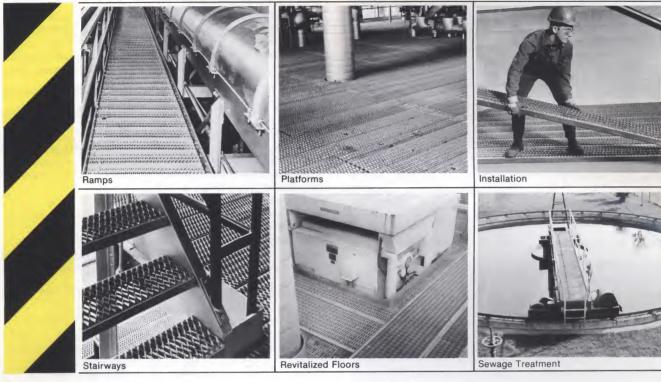
distribution

GRIP STRUT Safety Grating and GRIP STRUT Safety Stair Treads are stocked by distributors in principal cities. Consult the local classified telephone directory under Gratings for qualified assistance.

technical assistance

For technical assistance, complete product information, allowable load and deflection data and other design details, see GRIP STRUT Safety Grating catalogs G-60 (regular) and G-666 (heavy duty) available from your GRIP STRUT Grating distributor or phone toll-free (800) 621-7789; in Illinois (312) 321-5856.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAM-AGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.



description and utility

GRIP STRUT Safety Grating has been engineered to provide maximum safety underfoot, exceptional load-carrying capacity, and lightweight, self-framing, one-piece construction. Now available, new heavy-duty type GRIP STRUT Safety Grating has all features of the regular product plus added load-carrying capacity and longer service life. GRIP STRUT Grating helps meet OSHA standards for walking-working surfaces and is ideally suited for all types of work platforms, open flooring, catwalks, balconies, storage areas, walkways and stair treads. It has been used extensively by the transportation, pulp and paper, chemical, mining, food processing, waste and sewage treatment and oil industries for these and other applications. Also highly suited for renovating worn concrete, checker plate and bar grating floors to provide a non-slip surface.

GRIP STRUT Grating has reticulated and formed metal cross struts arranged in a diamond pattern with integrally formed channels at the edges. The cross struts form a slip-resistant, resilient walking surface with sufficient open area to provide ample passage of light and air. Other features:

High Strength—lightweight, one-piece construction develops strength from the section and a high load capacity per pound. Some styles are suitable for spans up to 12 ft.

Safety Surface—the unique surface pattern makes GRIP STRUT Safety Grating slip-resistant in all directions. Both types meet anti-slip values set forth in Fed. Spec. RR-G-1602A.

Easily Installed—most sections can be handled by one man. Cuts readily—is rapidly welded, bolted or clamped into place.

Large Open Area—permits free flow of air, heat and light. Often eliminates need for extra sprinklers under catwalks and platforms.

Economical—low in initial cost. Quickly installed, self-cleaning. Standard galvanized or hot-dip galvanized finish minimizes maintenance. Plain finish is easily painted for low maintenance costs. Light weight with high strength can result in structural steel savings.

types and functions

GRIP STRUT Gratings are manufactured in regular and heavy-duty types and in various channel depths and gauges to accommodate design loads needed for pedestrian traffic or those encountered in light storage or equipment installations. GRIP STRUT Grating is produced in galvanized steel, carbon steel, aluminum and stainless steel to meet corrosion-resistance requirements, provide long-lasting service and low life-cycle costs. GRIP STRUT Grating products include:

1. GRIP STRUT Safety Grating has a highly slip-resistant serrated surface for use where safety underfoot is a prime requirement. The regular type comes in widths from 4¾ to 24-in. and lengths up to 14 ft. The heavy-duty type is made in 9¼, 13¾, 27% and 36-in. widths, 10 and 12-ft. standard lengths. Also available with flat metal both sides of matrix for fabrication to suit requirements and in regular type, with specially formed sides for use in reconditioning floors and stairs.

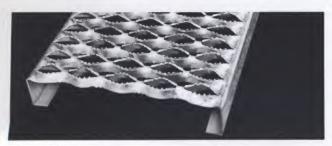
2. GRIP STRUT Safety Grating Walkway, with integral Z-flanges, meets OSHA requirements for toeboards on elevated runways. The high flanges help prevent tools and parts from falling over the edges and make the grating ideal for conveyor walkways on spans up to 12 ft. This exceptionally strong walkway material is produced in two types: regular in 24-in. widths with 4½-in. high flanges; heavy-duty in 30 and 36-in. widths in steel and 275%" width in aluminum, both with 5-in. high flanges.



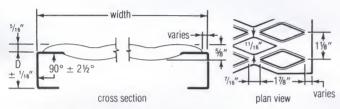
12-gauge GRIP STRUT Grating-heaviest available until now.



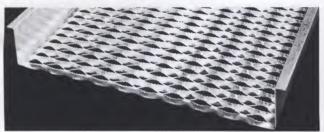
New 9-gauge GRIP STRUT Grating readily handles the tough jobs.



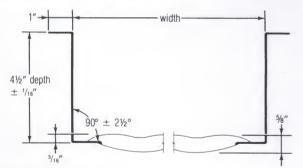
GRIP STRUT Safety Grating



safety or non-serrated grating



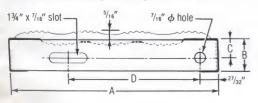
GRIP STRUT Safety Grating Walkway



safety grating walkway



GRIP STRUT Safety Grating Stair Tread



dimensions A, B, C, & D have a tolerance ± 1/16"

treads available in safety edge as shown, or in intermediate type

3. GRIP STRUT Safety Grating Stair Treads are ready-to-install units fabricated from GRIP STRUT Safety Grating. Treads of regular grating are available with standard nosing in 4¾, 7, 9½ and 11¾-in. widths and with abrasive nosing in 8⅓ and 10½-in. widths. Heavy duty treads are 9¼-in. wide. Standard lengths: 24, 30, 36 and 48 in.; special lengths available on order.

4. GRIP STRUT Non-serrated Grating provides a high-strength, light-weight, all purpose pedestrian traffic way, platform or storage deck.

product data—regular grating

available metals and finishes

- a. galvanized steel—hot-dip galvanized before fabrication, ASTM A525, standard; also available hot-dip galvanized after fabrication on special order. With pregalvanized sheets, cut edges are protected by the electrochemical action of the zinc.
- b. carbon steel—hot rolled, pickled and oiled.
- c. stainless steel—alloy type 304, 2D finish; alloy type 316L, 2B finish. These alloys offer excellent corrosion resistance, high strength and good weldability.
- **d. aluminum**—alloy 5052-H32, mill finish, lightly oiled. In addition to light weight, this alloy offers strength and corrosion resistance.

grating lengths-10 and 12 ft. in all materials and sizes.

grating-styles available

-11	gauge	weigh	t—lb. per	r lin. ft.			
channel height(2)	& type	43/4"	7"	91/2"	11¾″	18¾"	24"
11/2" 2" 21/2" 3" 41/2" walkway	14-ga. steel	2.3 2.6 2.8 —	3.0 3.2 3.5 —	3.6 3.8 4.1 —	4.2 4.4 4.7 —	6.1 6.3 6.6	7.4 - 7.9 8.9
1½" 2" 2½" 3" 4½" walkway	12-ga. steel	3.2 3.6 4.0 —	4.1 4.5 4.9 5.2	5.0 5.4 5.7 6.1	5.9 6.2 6.6 7.0	8.5 8.9 9.2 9.6	10.4 — 11.1 12.5
2"	12-ga.(.080') aluminum(1)	0.9	1.2	1.4	1.6	_	_
2'	10-ga.(.100') aluminum(1)	1.2	1.5	1.7	2.0	2.8	_
2'	16-ga.stls.stl. types 304 & 316L	_	_	3.2	3.7	_	_

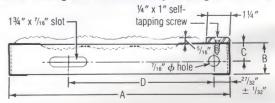
(1)11/2", 21/2" and 3" channel heights available on special order. (2) Add $\frac{5}{16}$ " for overall depth.

stair tread-styles available

standard	i			with abr	with abrasive nosing				
A	В	С	D	A	В	С	D		
4¾" (2 dia.)	1½" 2"	3/4" 1"	_	-	_	_	_		
7" (3 dia.)	1½" 2"	3/4" 1"	3¾" 3¾"	81/8" (3 dia.)	1½" 2"	3/4" 1"	41/2"		
9½" (4 dia.)	1½" 2"	3/4" 1"	57/8" 57/8"	10½" (4 dia.)	1½" 2"	3/4" 1"	67/8" 67/8"		
11¾" (5 dia.)	1½" 2"	3/4" 1"	8½" 8½"	-	-	_	_		

Length tolerance: $\pm 1/6$ ". For key to dimensions, see drawings below.

Abrasive Nosing Grip Strut Safety Grating Stair Tread



product data—heavy duty grating

available metals and finishes

- a. galvanized steel—hot-dip galvanized before fabrication, ASTM A525, standard; also available hot-dip galvanized after fabrication on special order.
- b. carbon steel-unpainted, hot rolled, pickled and oiled.
- c. aluminum-alloy 5052-H32, mill finish lightly oiled.

grating lengths—10 and 12 ft. in all materials and sizes.

grating-styles available

	gauge	weight	-lb. per li	in. ft.		
channel height(1)	& type	91/4"	13¾"	275/8"	30"	36"
2" 2½" 3" 4"	11-ga. steel	6.6 7.0 7.5 8.3	8.5 8.9 9.3 10.1		=	=
2" 2½" 3" 4" 5" walkway	10-ga. steel	7.4 7.9 8.4 9.3	9.5 10.0 10.5 11.4	=		19.9 20.4 20.9 21.8 22.7
2" 2½" 3" 4" 5" walkway	9-ga. steel	8.3 8.8 9.3 10.3	10.6 11.1 11.6 12.7	=		22.1 22.7 23.2 24.2 25.3
2" 2½" 3" 4"	.150" aluminum	2.6 2.8 3.0 3.3	3.4 3.6 3.8 4.1	5.8 6.0 6.2 6.5	=	=
5" walkway	.160" aluminum	_	_	6.8	_	_

(1)Add 21/32" for overall depth.

stair treads

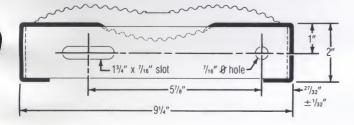
Stair treads are available made from 10 ga. steel and .150" aluminum grating with 2" channel in 91/4" width; 24", 30", 36" and 48" length.

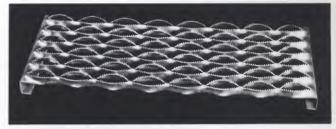
fabrication service

On large jobs, United States Gypsum estimates, quotes, details and fabricates to your requirements. Lump-sum quotations are made from submitted plans and specifications. After receipt of order, a bill of materials and necessary layout drawings are prepared. Grating is supplied with special cutting, banding and toe plates installed where needed. This fabrication service is available through your GRIP STRUT Grating distributor.

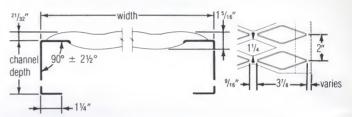


Heavy Duty GRIP STRUT Grating Stair Tread

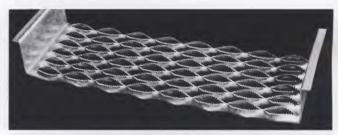




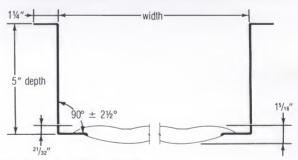
Heavy Duty GRIP STRUT Safety Grating



heavy duty safety grating



Heavy Duty GRIP STRUT Safety Grating Walkway



heavy duty safety grating walkway

specifications—notes to architect

- 1. These specifications are presented as a general guide to the architect or structural engineer in preparing project specifications. Allowable loads, spans and other limiting conditions presented in this folder offer product data for use in design and construction. These products must not be used without prior structural design by a qualified engineer or architect.
- **2.** Supports should provide a smooth, level 11/2" minimum bearing surface, free of burrs, bridging, welds or other irregularities.
- 3. Banding-random cut ends and diagonal or circular cut exposed edges should be banded with a bar at least 1/8" thick and equal to the overall grating thickness welded at contact points.
- **4. Bolted connections**, except stair or ladder tread attachment to stringer channels, may be replaced by welded connections that develop the same strength.
- 5. Design Aids—miniature "Specifications Drawings" of GRIP STRUT Grating Products, G-413, and "Design Drawings for Stair Systems", G-404, are available, at no cost, for use in design and drawing preparation. Also available, U.S.G. folder "OSHA Standards for Walking-

Working Surfaces", G-583, to help designers comply with these regulations. Ask your GRIP STRUT Grating Distributor for them.

Part 1: general

1.1 scope

The contractor shall furnish and install GRIP STRUT Grating and Stair Treads, as specified, in all areas where shown on the drawings.

1.2 qualifications

All GRIP STRUT Grating, Stair Treads and accessories, unless otherwise indicated, shall be manufactured by Metal Products Division, United States Gypsum Company and installed in accordance with its current printed directions. Safety surface shall be slip resistant in all directions and meet anti-slip values in Fed. Spec. RR-G-1602A.

1.3 submittals

The contractor shall furnish shop drawings of grating layout, framing and supports, unit dimensions and sections, type and location of fasteners and welds.

1.4 storage and handling

All materials shall be stored and handled to avoid damage. Damage or deteriorated materials shall be removed from the premises.

Part 2: products

2.1 grating materials

- a. Type: (Regular) (Heavy Duty) (GRIP STRUT Safety Grating) (GRIP STRUT Safety Grating Walkway).
- b. Metal and Finish: (select from pages 2 and 3).
- c. Metal gauge: Regular [(14-ga.)(12-ga.) steel] [16-ga. stainless steel] [(.080")(.100") aluminum]; Heavy Duty [(11-ga.)(10-ga.)(9-ga.) steel] (.150")(.160") aluminum].
- d. Section width: Regular, (4¾")(7")(9½")(11¾")(18¾")(24") Heavy Duty, (9¼")(13¾")(275%")(36").
- e. Channel depth: Regular (1½")(2")(2½")(3"), Heavy Duty (2")(2½") (3")(4"), Regular Walkway—4½", Heavy Duty Walkway—5".

2.2 stair tread materials

- a. Type: (Regular) (Heavy Duty) GRIP STRUT Safety Grating Tread (with Abrasive Nosing).
- b. Metal and Finish: (select from pages 2 and 3).
- c. Tread depth: Regular, (2 dia. 4¾" wide) (3 dia. 7" wide) (4 dia. 9½" wide) (5 dia. 11¾" wide); Heavy Duty (2 dia. 9¼" wide).
- d. Channel height: (11/2") (2").
- e. Gauge: Regular, (14-ga. steel) (12-ga. steel) (16-ga. stainless steel) (.080" aluminum) (.100" aluminum); Heavy Duty, (10-ga. steel) (.150" aluminum).
- f. Span or width of staircase: (24") (30") (36") (48").

2.3 accessories (regular grating)

- a. Anchor and Clamp Assembly: electrogalvanized with (1½")(2") (2½") (3") J-bolts, nuts, washers.
- b. GRIP STRUT Anchoring Device: mill-galvanized (use with 5/16" carriage bolts, nuts, washers obtained locally).
- c. GRIP STRUT Splice Plate: (7", 10-ga. mill-galvanized) (30", 12-ga. mill galvanized) with bolts, hex nuts, washers.

2.4 accessories (heavy duty grating)

 a. Hold Down Clip: mill-galvanized (use with 3/8" square neck carriage bolts, nuts, washers obtained locally).

Part 3: execution

3.1 condition of surfaces

Prior to grating installation, contractor shall inspect supports for correct size, layout, alignment and verify that surfaces to receive grating are free of debris. Contractor shall report to architect or owner's agent

in writing any defects considered detrimental to proper application of grating so defects can be remedied before grating is applied.

3.2 grating installation

Install grating in accordance with manufacturer's recommendations and shop drawings. Position grating sections flat and square with ends bearing min. 1½" on supporting structure. Keep grating sections at least ¼" away from vertical steel sections and ½" from concrete walls. Allow clearance at joints between grating sections of max. ¼" at side channels and max. ¾" at ends. When specified, band random cut ends and diagonal or circular cut exposed edges with a min. ½" thick bar welded at contact points.

Join abutting ends of walkway sections with GRIP STRUT Splice Plates bolted to outside of side rails or welded as specified.

3.3 grating attachment

Attach grating to supports without warp or deflection as follows:

- a. Single plank application—Secure plank ends to supporting members at every point of contact. Use two GRIP STRUT Anchoring Devices (regular grating) or two Hold Down Clips (heavy duty grating) at each end or secure side channel ends to supports with 1/8" fillet welds, 1" long.
- **b. Multiple plank application**—Secure perimeter plank to supporting members at every point of contact and intermediate grating sections with at least one attachment each end of plank, on alternate sides. For added rigidity when span exceeds (6'-0") (8'-0"), attach side channels of adjacent plank together at mid-point of span.
- 1. Welded attachment—Secure side channels to supports by fusion welding with 1/8" fillet welds, 1" long. Weld planks together with 1/8" fillet welds, 1" long spaced 24" o.c. and staggered top and bottom.
- 2. Clamp attachment—Secure intermediate planks of regular grating to supports using anchor and clamp assembly. Use GRIP STRUT Anchoring Device with 5/16" carriage bolts and nuts for securing perimeter planks. Fasten adjacent side rails together with 3/6" machine bolts and nuts.
- 3. Bolt attachment—Secure plank to supports with GRIP STRUT Anchoring Device (regular grating) or Hold Down Clips (heavy duty grating). Fasten adjacent side rails together with %" machine bolts and nuts.

3.4 stair tread installation

Install GRIP STRUT Stair Treads shown on the drawings or as herein specified. Fasten treads to stair stringers with %'' x 1" machine bolts and nuts.

distribution

GRIP STRUT Safety Grating and GRIP STRUT Safety Stair Treads are stocked by distributors in principal cities. Consult the local classified telephone directory under Gratings for qualified assistance.

technical assistance

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lightweight, load-bearing framing for light commercial, single- and multi-family residential buildings

USG Steel Framing Systems offer lightweight, noncombustible, corrosion-resistant framing for load-bearing exterior walls, interior partitions and floor/ceilings in residential, apartment and light-commercial construction. Studs, runners and joists are channel-type sections, roll-formed from hot-dip galvanized steel. Sections are designed for superior performance, fast assembly, ready accommodation of conduit and piping, and screw attachment of surfacing materials.

benefits

Lightweight – High strength-to-weight ratio means lighter sections, easy to handle and fast to install. Ground-level panel assembly becomes practical.

Versatile-Ideal for buildings one to four stories high.

Exclusive features—Engineered for greater loads, these special shapes including dimension-lumber depths nest with virtually no dimensional change and permit easy substitution for wood. Framing mates readily with door frames and surfacing materials. Superior performance—Framing is noncombustible, tested in various sound- and fire-rated assemblies, and meets model building code and HUD requirements. Assembly ratings listed on page 2. Framing capitalizes on the superior strength, rigidity, uniform quality and corrosion resistance of galvanized steel. Provides a smooth base for surfacing panels; minimizes squeaks, eliminates nail pops.

Low in-place cost—Installation is rapid, saving time and money. Wider 24-in. spacing cuts the number of studs and joists needed—by almost one-third as compared to the 16-in. spacing for wood framing. Custom-cut lengths eliminate scrap and expensive job cutting. Color coding reduces job-site sorting. Assembly, conduit and lateral bracing channel installation are speeded by factory-punched holes. Surfacing-material attachment is simplified by wide flanges.

Reliable pricing—Market prices of steel are relatively stable, making cost estimates more reliable—and profits more consistent.

framing systems

USG SJ Stud/Joists—SJ style with stiffened flanges in 12 sizes and factory-cut lengths to 30 ft., for exterior walls and interior partitions, including one-to-two-hour fire-rated assemblies—providing up to 50 STC. Also in many variations for floor and ceilings, including a fire-rated assembly of 2 hr. (see test table, p.2), plus a complete line of joist accessories.

USG CS Channel Studs—CS style with unstiffened flanges available in 4 sizes, each in 18, 16 and 14 gauge, factory cut in lengths to

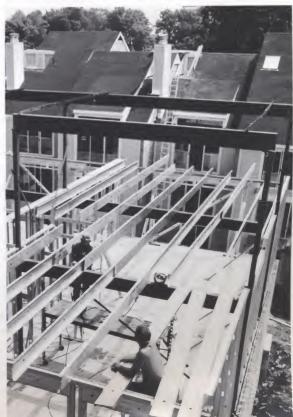
USG Steel Runners—CR style to match stud sizes, C-channel type.

This folder gives typical details and complete data on the USG Steel
Framing System for load-bearing applications; for complete struc-

tural/architectural details and technical information, consult USG Steel Framing Systems Manual CS-54. For complete data on USG Steel Studs in non-load bearing curtain wall applications, consult USG

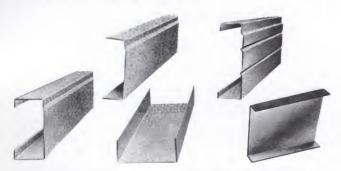
Ground-assembled wall panels speed erection, save time and money (top). Lightweight, noncombustible framing offers fire-rated assemblies for use in multi-family residences (bottom).







Wider allowable frame spacing reduces costs.



USG Steel Studs and Runners

USG Steel Joists and C-Closures

Exterior Curtain Wall Folder SA-805, Sec. 8.14/Un of Sweet's General Building File or obtain data from your U.S.G. sales representative. For interior non-load bearing partition applications, consult USG Steel-Framed Drywall Systems Folder SA-923, Sec. 9.5/Ud of Sweet's General Building File.

limitation

Allowable loads, spans and wall heights, framing and fastener spacing and other limiting conditions presented in this folder serve as a general guide for design and construction. Products must not be used in a structure without prior complete design and evaluation for satisfactory performance, as verified by a qualified structural engineer or architect.

USG Steel Studs

Wall framing with USG Steel Studs offers a weight saving and permits ground-assembly of tilt-up panels for economy of labor. Reduced dead load means structural savings as well, while the assembly's noncombustibility may reduce insurance rates.

The studs may be nested to carry greater loads. Studs can be used singly, nested, and in combinations to suit wall and load conditions. They also can be used in non-load bearing curtain walls or partitions. Stud webs have 1½x4-in. prepunched holes for speedy mechanical/

test data

fire	fire-rated construction-floor/ceiling	acoustic	al performance	
rating	description & test no.	STC IIC	description & test no.	
1 hr. est.	%" SHEETROCK Brand FIRECODE "C" gypsum panels—USG 75SJ18 steel joists 24" o.c. – 21/2" conc fir on corrug steel deck—gypsum panel ceiling att to joists with 1" Type S-12 screws 12" o.c. – joints fin – est. fire rating based on witnessed laboratory test	45 70	Based on RC-1 resil chan 24" o.c. - KAL-443536 Based on carpet & pad-KAL-443535	A
1hr. (beam 1 hr.)	½" SHEETROCK Brand FIRECODE "C" gypsum panels—USG 725SJ18 steel joists 24" o.c%" T & G plywd fir att to joists with Type S-12 screws 6" o.c. around perim., 10" o.c. in field—dbl layer gypsum panel clg and dbl layer gypsum panels around beam—joints exp—includes unrestrained beam—UL Des L524	39 43 56 60	Based on 95SJ16 joists – USG-760105 Based on 95SJ16 joists and 3" sound atten blankets" – USG-760310 Based on 95SJ16 joists and carpet & pad – USG-760106 Based on 95SJ16 joists and carpet & pad wit 3" sound atten blankets" – USG-760405	B
1½ hr.	Resilient %" SHEETROCK Brand FIRECODE "C" gypsum panels—USG 95SJ16 steel joists 24" o.c.—¾" T&G plywd flr att to joists with Type S-12 screws 24" o.c.—dbl layer gypsum panel clg att to RC-1 chan screw att to joists 16" o.c.—base panels att with 1" Type S screws 24" o.c.—face panels att with 1½" Type G screws 8" o.c. at butt joints, 1%" Type S screws 12" o.c. in field—joints fin—UL Des L527	48 51	USG-771101 Based on carpet & pad – SA-781110	С
2 hr. est.	%" SHEETROCK Brand FIRECODE "C" gypsum panels—USG 75SJ18 steel joists 24" o.c. – 2½" conc fir over corrug steel deck—dbl layer gypsum panel ceiling—base panels att with 1" Type S-12 screws 12" o.c. – face panels att with 1%" Type S-12 screws 12" o.c. – joints stag and fin – est. fire rating based on witnessed laboratory test	44 73 47	KAL-443533 Based on carpet & pad – KAL-443680 Based on RC-1 resil chan 24" o.c. – KAL-443534	0

^{*}Insulation may affect fire rating. See SA-905.

fire	fire-rated construction-interior walls (1)	acoust	tical performance	
rating	description & test no.	STC		
1 hr.	%" SHEETROCK Brand FIRECODE gypsum panels – 35SJ20 studs 24" o.c. – panels appl vert & att with 1" Type S-12 screws 12" o.c. – joints fin – load bearing up to 100% allowable stud axial load – UL Des U425	40 41	USG-810519 Based on 2" sound atten blankets in cavity-USG-810518	E
2 hr.	Dbl layer %" SHEETROCK Brand FIRECODE gypsum panels—35SJ20 studs 24" o.c.—panels appl vert—base layer att with 1" Type S-12 screws 12" o.c.—face layer att with 1\%" Type S-12 screws 12" o.c.—joints fin—load bearing up to 80\% allowable stud axial load—UL Des U425	48	Based on 2" sound atten blankets in cavity—USG-811006	F

fire	fire-rated construction-exterior walls (1)	acoust	tical performance	
rating	description & test no.	STC		
1 hr.	5/6" FIRECODE gypsum sheathing exterior 35SJ20 studs 24" o.c. 5/6" SHEETROCK Brand FIRECODE gypsum panel interior panels app vert & att with 1" Type S-12 screws 12" o.c. load bearing up to 100% allowable stud axiai load UL Des U425	44	Est. ±3 STC based on computer simulation using 3" sound atten blankets	G
2 hr.	Dbl layer %" FIRECODE gypsum sheathing exterjor-35SJ20 studs 24" o.cdbl layer %" SHEETROCK Brand FIRECODE gypsum panel interior-base layer att with 1" Type S-12 screws 12" o.cface layer att with 1%" Type S-12 screws 12" o.cload bearing up to 80% allowable stud axial load-UL Des U425	50	Est. ±3 STC based on computer simulation using 3" sound atten blankets	Н

⁽¹⁾ Other fire test constructions shown in UL Design U425. See FOAMULAR Extruded Polystyrene Insulation System Folder SA-710 for 1-hour test data using rigid-foam insulation.

electrical installation and lateral bracing with $1\frac{1}{2}$ " cold-rolled channels. Members are color-coded for easy job-site identification.

product identification

USG Steel Framing carries a three-part code that identifies the size (35-3½", 362-35%", etc.). Style (SJ-stud or joist, CR-C-runner, CS-channel stud) and steel gauge thickness (see table below) based on gauges.

Nomenclature: 35SJ20

35 size -31/2"

SJs

style SJ stud/joist CR C-runner

CS channel stud WS web stiffener 20 g

gauge designation – thickness

USG Steel Runners

Runners are set at floor and ceiling to receive studs, which are then attached with USG Screws. Arc welding is a suitable alternate to connecting framing with USG Screws. Generally, gas metal arc welding (GMAW)—MIG welding and shielded metal arc welding (SMAW)—stick welding can be used depending on metal thickness.

thickness-steel components (1)

	design	(2)	minimum		
style	in	mm	in	mm	gauge (3)
SJ, CR22	0.0299	0.76	0.0284	0.72	22
SJ. CR20	0.0359	0.91	0.0341	0.87	20
SJ, CS, CR18	0.0478	1.21	0.0454	1.15	18
SJ, CS, CR16	0.0598	1.52	0.0568	1.44	16
SJ. CS. CR14	0.0747	1.90	0.0710	1.80	14

(1) Uncoated steel thickness; meets ASTM A568. Studs meet ASTM C645. Coatings are hot-dip galvanized (G-60) per ASTM A525; aluminized per ASTM A463, or 55% aluminum-zinc. (2) Conforms to AISI Specification for the Design of Cold Formed Steel Stuctural Members, 1980 edition. (3) For information only; refer to limiting height and structural properties table for design data.

USG Steel Joists

Economical USG Steel Joists are suitable for either floor or roof construction. They fit readily with common wall and foundation materials, flooring and drywall ceilings. Joists are installed with standard hand power tools and are nested for stairway headers.

USG Steel Joists usually cost less than wood, since at 24 in. o.c., fewer of them carry equivalent loads of wood joists at 16 in. o.c. In addition, they install faster than wood joists. They average up to 25% lighter for the same depth, and lengths are factory cut to eliminate field-cutting, waste and scrap-cleanup.

Steel joists are noncombustible, providing rated floor/ceiling assemblies as shown in the fire-rating table. Predictable properties of steel permit greater spans with known safety factors. Their dimensional stability helps prevent squeaky floors.

accessories

USG Steel Framing Accessories include: *C-Closure* for joist ends; prepunched *End Clip* for screw-connections of joists; slotted *Foundation Clip* for header attachment to anchor bolts; prepunched *Joist Hanger* for attachment of joists to headers; steel *V-Bracing*, *Flat Strap Bracing* and *Cold-Rolled Channels* for bridging, diagonal and lateral bracing; *Slide Clip* for steel stud framing in curtain wall assemblies; 14-ga. *Joist Web Stiffener* for transmitting concentrated loads and/or reactions; *USG Screws* for electrical screw gun attachment of framing components and of plywood subflooring to joists. Joist Reinforcement used at intermediate supports are field-cut joists.

limitations

Minimum joist bearing is $1\frac{1}{2}$ in. ($3\frac{1}{2}$ in. when USG joist web stiffener is used). Ceramic tile applied to wood floors over steel joists must comply with current specifications of Tile Council of America. For cantilevers such as overhangs and balconies and other framing conditions not covered in the tables, joist size, spacing and reinforcing must be separately calculated.

High-performance, versatile steel framing is ideal for curtain wall and load-bearing construction.





physical and section properties (1)

studs/joists-SJ style



table 1

												Y					,	lable
size,	size	(in)	weight	(2)		design steel	ailow.		major	axis		minor	axis					
style & gauge	nom.	actuai	(ib/ft)	(kg/m)	net area (3) (in²)	thick- ness (3) (in)	bending stress- ksi (4)	lip width (in)	ix (in ⁴)	Sx (in³)	rx (in)	ly (in ⁴)	Sy (in³)	ry (in)	(column factor)	J (in⁴)	Cw (in ⁶)	Xo (in)
35SJ22* 35SJ20* 35SJ18* 35SJ16* 35SJ14*	31/2	3.421 3.421 3.421 3.421 3.421	0.80 0.95 1.22 1.56 1.96	1.19 1.41 1.82 2.32 2.92	0.176 0.210 0.277 0.359 0.442	0.0299 0.0359 0.0478 0.0598 0.0747	23.2 24.0 24.0 24.0 24.0	0.500 0.500 0.500 0.625 0.625	0.405 0.488 0.639 0.806 0.986	0.222 0.277 0.364 0.459 0.561	1.376 1.373 1.367 1.355 1.348	0.070 0.083 0.108 0.143 0.173	0.068 0.081 0.104 0.144 0.174	0.626 0.623 0.618 0.631 0.624	0.660 0.766 0.795 0.800 0.798	0.0001 0.0001 0.0003 0.0005 0.0010	0.2348 0.2770 0.3563 0.5306	1.38 1.37 1.36 1.44
362S22* 362S20 362S18 362S16 362S14	35/8	3.573 3.573 3.573 3.573 3.573	0.82 0.97 1.24 1.59 2.00	1.22 1.44 1.85 2.37 2.98	0.181 0.216 0.285 0.368 0.454	0.0299 0.0359 0.0478 0.0598 0.0747	23.0 24.0 24.0 24.0 24.0	0.500 0.500 0.500 0.625 0.625	0.449 0.541 0.708 0.894 1.094	0.235 0.293 0.386 0.487 0.596	1.432 1.429 1.423 1.411 1.404	0.072 0.085 0.111 0.147 0.178	0.068 0.082 0.106 0.146 0.176	0.624 0.621 0.616 0.629 0.622	0.648 0.752 0.799 0.804 0.802	0.0010 0.0001 0.0001 0.0003 0.0005 0.0011	0.6350 0.2558 0.3019 0.3884 0.5749 0.6885	1.42 1.36 1.35 1.34 1.41 1.40
40SJ20 40SJ18 40SJ16 40SJ14	4	3.921 3.921 3.921 3.921	1.02 1.30 1.67 2.09	1.52 1.93 2.48 3.11	0.228 0.301 0.388 0.480	0.0359 0.0478 0.0598 0.0747	23.5 24.0 24.0 24.0	0.500 0.500 0.625 0.625	0.673 0.882 1.116 1.367	0.333 0.439 0.555 0.680	1.556 1.550 1.539 1.532	0.091 0.117 0.157 0.189	0.083 0.108 0.150 0.181	0.617 0.611 0.626 0.619	0.721 0.803 0.812 0.811	0.0001 0.0003 0.0006 0.0011	0.3639 0.4687 0.6855 0.8219	1.31 1.29 1.37 1.35
55SJ20* 55SJ18* 55SJ16* 55SJ14*	51/2	5.421 5.421 5.421 5.421	1.21 1.55 1.98 2.49	1.80 2.31 2.95 3.71	0.282 0.373 0.478 0.592	0.0359 0.0478 0.0598 0.0747	21.4 23.3 24.0 24.0	0.500 0.500 0.625 0.625	1.448 1.903 2.418 2.974	0.520 0.688 0.874 1.075	2.083 2.076 2.071 2.063	0.100 0.139 0.187 0.227	0.084 0.113 0.160 0.194	0.595 0.589 0.605 0.598	0.612 0.685 0.744 0.802	0.0001 0.0004 0.0007 0.0013	0.7197 0.9299 1.3169 1.5852	1.15 1.14 1.20 1.19
60SJ20 60SJ18 60SJ16 60SJ14	6	5.921 5.921 5.921 5.921	1.27 1.63 2.08 2.62	1.89 2.43 3.10 3.90	0.300 0.397 0.508 0.629	0.0359 0.0478 0.0598 0.0747	20.6 22.7 24.0 24.0	0.500 0.500 0.625 0.625	1.787 2.351 2.990 3.679	0.588 0.779 0.991 1.219	2.253 2.246 2.243 2.234	0.100 0.144 0.195 0.236	0.084 0.114 0.161 0.197	0.587 0.581 0.598 0.591	0.582 0.653 0.710 0.767	0.0002 0.0004 0.0007 0.0014	0.8721 1.1277 1.5867 1.9117	1.109 1.098 1.16
725SJ18* 725SJ16* 725SJ14*	71/4	7.171 7.171 7.171	1.84 2.34 2.95	2.74 3.48 4.39	0.457 0.583 0.723	0.0478 0.0598 0.0747	21.3 22.8 24.0	0.500 0.625 0.625	3.732 4.754 5.858	1.023 1.304 1.606	2.663 2.664 2.654	0.146 0.208 0.255	0.114 0.162 0.201	0.562 0.579 0.572	0.583 0.637 0.691	0.0004 0.0008 0.0016	1.7245 2.3996 2.8964	1.004 1.063 1.049
75SJ18* 75SJ16* 75SJ14*	71/2	7.421 7.421 7.421	1.88 2.40 3.02	2.80 3.57 4.49	0.469 0.598 0.741	0.0478 0.0598 0.0747	21.0 22.6 23.9	0.500 0.625 0.625	4.057 5.168 6.370	1.075 1.370 1.688	2.745 2.746 2.737	0.147 0.209 0.259	0.114 0.162 0.201	0.558 0.575 0.568	0.570 0.624 0.677	0.0004 0.0008 0.0016	1.8620 2.5869 3.1230	0.987 1.045 1.032
30SJ18 30SJ16 30SJ14	8	7.921 7.921 7.921	1.97 2.50 3.15	2.93 3.72 4.69	0.493 0.628 0.779	0.0478 0.0598 0.0747	20.5 22.2 23.5	0.500 0.625 0.625	4.756 6.060 7.474	1.182 1.506 1.857	2.908 2.911 2.901	0.147 0.210 0.265	0.114 0.162 0.202	0.550 0.568 0.561	0.547 0.600 0.652	0.0004 0.0009 0.0017	2.1555 2.9862 3.6070	0.955 1.012 0.998
925SJ16* 925SJ14* 95SJ16	91/4	9.171 9.171 9.421	2.76 3.48 2.81	4.11 5.18 4.18	0.702 0.872 0.717	0.0598 0.0747 0.0598	21.1 22.7 20.9	0.625 0.625 0.625	8.692 10.731 9.291	1.869 2.307	3.316 3.306	0.213 0.275	0.163 0.203	0.550 0.543	0.546 0.594	0.0009 0.0018	4.1348 4.9992	0.938
95SJ14 115SJ16	111/2	9.421	3.55 3.23	5.28 4.81	0.891	0.0747	22.5 19.2	0.625	11.472	2.402	3.396 3.386 4.030	0.214 0.276 0.216	0.163 0.203 0.163	0.547 0.540 0.521	0.537 0.584 0.470	0.0010 0.0019 0.0011	4.3907 5.3095 6.7620	0.924 0.912 0.830
135SJ14 135SJ14	131/2	13.421		6.06	1.040	0.0747	21.1 19.8	0.625	18.580 27.992	3.215 4.128	4.018 4.639	0.280	0.204	0.514	0.512	0.0021	8.1854 11.7786	0.818

⁽¹⁾ The contents of this folder apply only to steel having a yield strength of 40 ksi for members; 33 ksi for runners. Narrower flange is 1.552 in.; wider flange is 1.724 in. outside width for all SJ-style members. (2) Steel with corrosion-resistant coating. (3) Steel without coating. (4) Smaller value of basic design stress per Sec. 3.1 and web bending stress per Sec.

3.4.2, AISI Specification for the Design of Cold-Formed Steel Structural Members, 1980 Edition. Section property modifications per Section 2.3.5 not included. *Non-standard items available only on special order.

runners

table 2 design steel major axis (4) size, size (in) weight (2) fuil thickflange style & area (3) (in²) width ness (3) Ec gauge actual (lb/ft) (kg/m) (in) (in) (in4) (in3) (in) (ksi) 35CR22 31/2 3.572 0.59 0.88 0.163 0.0299 1.00 0.289 0.162 1.333 11.30 35CR20 3 584 0.70 1.04 0.195 0.0359 1.00 0.348 0.194 1.334 12.77 35CR181 3.605 0.91 1.35 0.260 0.0478 1.00 0.463 0.257 1.335 16.00 35CR16 3.635 1.13 1.68 0.325 0.0598 1.00 0.583 0.321 1.339 17.97 35CR14 3.664 1.43 2.12 0.406 0.0747 1.00 0.730 0.399 1.342 19.53 362CR22 35/a 3 697 0.60 0.89 0.167 0.0299 1.00 0.314 0.170 1.373 11.30 362CR20 3.709 0.72 1.07 0.200 0.0359 1.00 0.378 0.204 362CR18 1 374 12.77 3.729 0.93 1.38 0.266 0.0478 1.00 0.503 0.270 1.375 16.00 362CR16 3.760 1.16 1.73 0.333 0.0598 1.00 0.633 0.337 1.380 362CR14* 3.789 1.47 2.19 0.415 0.0747 1.00 0.793 0.419 1.382 19.53 40CR20 4 4.084 0.77 1.14 0.213 0.0359 1.00 0.477 0.234 1.495 12.77 40CR18 4.105 0.99 1.47 0.284 0.0478 1.00 0.635 0.310 1.496 16.00 40CR16 4.135 1.24 1.85 0.355 0.0598 1.00 0.799 0.387 1 500 17.97 40CR14 4.164 1.57 2.34 0.443 0.0747 1.00 1.000 0.481 1.502 19.53 55CR20 51/2 5.584 0.96 1.43 0.267 0.0359 1.00 1.034 0.371 1.967 12.77 55CR18 5.605 1.25 1.86 0.355 0.0478 1.00 1.376 0.492 1.968 16.00 55CR161 5.635 1.55 2.31 0.445 0.0598 1.00 1.728 0.614 1.971 17.97 55CR141 5.664 1.96 2.92 0.555 0.0747 1.00 2.160 0.763 1.973 19.53 60CR18 6 6.105 1.33 1.98 0.379 0.0478 1.00 1.708 2.144 0.560 2.122 16.00 60CR16 6.135 1.65 2 46 0.475 0.0598 1.00 0.699 2.125 17.97 60ÇR14 6.164 2.09 3.11 0.592 0.0747 1.00 2.679 0.870 2.127 19.53 725CR18* 7.355 1.61 2.39 0.463 0.0478 1.25 3.071 0.836 2.576 13.38 725CR16 7.385 2.02 3.00 0.579 0.0598 1.25 3.852 1.044 2.579 15.87 725CR14* 7.414 2.56 3.81 0.723 0.0747 1.25 4.814 1.299 2.580 17.86 75CR18 71/2 7.605 1.66 2.47 0.475 0.0478 1.25 3.342 0.879 2.653 13.38 75CR16 7 365 2.07 3.08 0.594 0.0598 1.25 4.191 1.098 2.656 15.87 75CR14° 7.664 2.62 3.89 0.742 0.0747 1.25 5.237 1.367 2.657 17.86 80CR18 8.105 1.74 2.59 0.499 0.0478 1.25 3.928 0.970 2.806 13.38 80CR16 8.135 2.17 3.23 0.624

0.0598

0.0747

1.25

1.25

2.75

8.164

per Section 3.2, AISI Specification for the Design of Cold-Formed Steel Structural Members, 1980 edition. Section property modifications per Section 2.3.5 not included. *Nonstandard items available only on special order.

1.211

1.508

2.809

2.810

17.86

4.925

6.153

^{4.09} 0.779 (1) The contents of this folder apply to steel having a yield strength of 40 ksi for members; 33 ksi for runners. (2) Steel with corrosion-resistant coating. (3) Steel without coating. (4) Section properties with allowable compressive stress on unstiffened elements, Fc as shown,



USG Steel Framing Systems SA-510

physical and section properties (1)

studs/joists-CS style

table 3

size, style &	size (i	n)	weight	(2)		design steel		major	axis (5)			minor	axis					
	nom.	actuai	(ib/ft)	(kg/m)	net area (3) (in²)	thick- ness (3) (in)	flange width(4) (in)	lx (in ⁴)	Sx (in ³)	rx (in)	Fc (ksi)	iy (in ⁴)	Sy (in ³)	ry (in)	(column factor)	J (in⁴)	Cw (in ⁶)	Xo (in)
35CS18* 35CS16* 35CS14*	3½ 3½ 3½ 3½	3.421 3.421 3.421	0.98 1.22 1.54	1.46 1.82 2.29	0.210 0.261 0.323	0.0478 0.0598 0.0747	1.296 1.296 1.296	0.482 0.595 0.731	0.277 0.342 0.420	1.326 1.321 1.314	12.58 17.04 19.89	0.040 0.049 0.060	0.041 0.051 0.063	0.413 0.411 0.409	0.391 0.528 0.616	0.0002 0.0004 0.0008	0.0966 0.1184 0.1441	0.764 0.761 0.758
362CS18	35/8	3.573	1.01	1.50	0.217	0.0478	1.296	0.535	0.295	1.378	12.58	0.041	0.042	0.410	0.394	0.0002	0.1071	0.750
362CS16	35/8	3.573	1.25	1.86	0.270	0.0598	1.296	0.661	0.364	1.372	17.04	0.050	0.052	0.408	0.533	0.0004	0.1312	0.748
362CS14*	35/8	3.573	1.58	2.35	0.335	0.0747	1.296	0.812	0.447	1.366	19.89	0.062	0.064	0.406	0.621	0.0008	0.1598	0.744
40CS18	4 4 4	3.921	1.07	1.59	0.234	0.0478	1.296	0.670	0.337	1.495	12.58	0.043	0.043	0.404	0.401	0.0002	0.1334	0.721
40CS16		3.921	1.33	1.98	0.291	0.0598	1.296	0.828	0.416	1.489	17.04	0.053	0.053	0.402	0.543	0.0005	0.1636	0.718
40CS14*		3.921	1.67	2.48	0.361	0.0747	1.296	1.018	0.512	1.483	19.89	0.065	0.066	0.400	0.633	0.0009	0.1994	0.714
60CS18	6 6	5.921	1.40	2.08	0.330	0.0478	1.296	1.832	0.612	2.145	12.58	0.052	0.047	0.371	0.357	0.0003	0.3525	0.589
60CS16		5.921	1.74	2.59	0.411	0.0598	1.296	2.272	0.759	2.139	17.04	0.064	0.058	0.369	0.500	0.0006	0.4335	0.586
60CS14*		5.921	2.20	3.27	0.510	0.0747	1.296	2.806	0.938	2.132	19.89	0.078	0.072	0.367	0.625	0.0012	0.5300	0.583

⁽¹⁾ The contents of this folder apply to steel having a yield strength of 40 ksi for members; 33 ksi for runners. (2) Steel with corrosion-resistant coating. (3) Steel without coating. (4) Narrower flange; wider flange is 1.375 in. outside width for all CS-style channel studs. (5)

Section properties with allowable compressive stress on unstiffened elements, Fc as shown, per Section 3.2, AISI Specification for the Design of Cold-Formed Steel Structural Members, 1980 edition. Section property modifications per Section 2.3.5 not included. *Nonstandard items available only on special order.

Interior Partition Stud

allowable axial loads when combined with 5-psf uniform lateral load

SJ style stud

table 4

stud clear heig	ht, spacing	ailowal	ole comp	ressive	load per	stud (1) (lb.)									
ioor/celling		31/2" stu	ıd—35SJ				35/8" s	tud-362	SJ			4" stud	-40SJ			51/2" stud
unbraced nt (1) (ft)	spacing (in o.c.)	22	20	18	16	14	22	20	18	16	14	20	18	16	14	55SJ20
3	12. 16. or 24	2158	2927	3979	5170	6341	2204	2996	4161	5388	6624	3106	4513	5865	7240	3326
9	12 16 24	2087 2087 2020	2812 2812 2812	3815 3815 3815	4950 4950 4950	6070 6070 6070	2139 2139 2126	2891 2891 2891	4003 4003 4003	5179 5179 5179	6364 6364 6364	3023 3023 3023	4371 4371 4371	5675 5675 5675	7003 7003 7003	3326 3326 3326
10	12 16 24	2007 1992 1740	2684 2684 2474	3631 3631 3591	4705 4705 4705	5766 5766 5766	2066 2066 1856	2774 2774 2653	3827 3827 3827	4944 4944 4944	6073 6073 6073	2927 2927 2927	4213 4213 4213	5463 5463 5463	6740 6740 6740	3326 3326 3326
11	12 16 24	1892 1736 1465	2542 2406 2099	3428 3428 3087	4434 4434 4251	5430 5430 5430	1986 1858 1585	2644 2593 2283	3632 3632 3387	4685 4685 4632	5752 5752 5752	2821 2821 2639	4038 4038 4031	5229 5229 5229	6448 6448	3300 3300 3300
12	12 16 24	1649 1486 1209†	2244 2061 1750†	3184 2972 2612	4137 4042 3634	5062 5062 4700	1778 1611 1326†	2439 2251 1931	3419 3273 2898	4402 4402 4003	5401 5401 5176	2705 2625 2295	3846 3846 3533	4973 4973 4853	6129 6129 6129	3242 3242 3242
fioor/celling		51/2" st	ud-55S	J (conti	nued)			6" stud-	60SJ				8" s	tud—80	SJ	
unbraced ht (1) (ft)	spacing (in o.c.)	20	18	-	16	14		20	18	16	5	14	18		16	14
10	12, 16 or 24	3326	48	66	6754	8924		3372	4947	68	366	9089	517	8	7217	9628
11	12, 16 or 24	3300	48	28	6655	8796		3372	4947	68	366	9089	517	8	7217	9628
12	12, 16 or 24	3242	47	31	6509	8584		3348	4914	67	774	8971	517	8	7217	9628
14	12 16 24	3111 3111 2905	45 45 45	13	6177 6177 6177	8103 8103 8103		3241 3241 3199	4734 4734 4734	65	501 501 501	8573 8573 8573	517 517 517	8	7217 7217 7217	9628 9628 9628
16	12 16 24	2960 2773 2358	42 42	62	5795 5795 5595	7549 7549 7549		3117 3099 2689	4526 4526 4386	6	186 186 186	8114 8114 8114	517 517 517	0	7163 7163 7163	9565 9565 9565

CS style stud

stud clear heig	ht, spacing	allowabl	e compres	sive load per	r stud (1) (lb.)							
fioor/ceiling		31/2" stud	1—35CS		35/8" stu	d-362CS		4" stud-	-40CS		6" stud-	-60CS	
unbraced ht (1) (ft)	spacing (in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
8	12, 16 or 24	1540	2477	3474	1599	2577	3616	1745	2806	3931	2176	3590	5281
9	12	1540	2477	3474	1599	2577	3616	1745	2806	3931	2176	3590	5281
	16	1540	2477	3474	1599	2577	3616	1745	2806	3931	2176	3590	5281
	24	1365	2477	3474	1468	2577	3616	1705	2806	3931	2176	3590	5281
10	12	1526	2447	3422	1599	2577	3616	1745	2806	3931	2176	3590	5281
	16	1425	2447	3422	1539	2577	3616	1745	2806	3931	2176	3590	5281
	24	1179	2276	3422	1294	2473	3616	1540	2806	3931	2176	3590	5281
11	12	1401	2357	3268	1519	2496	3479	1745	2806	3931	2176	3590	5281
	16	1248	2275	3268	1366	2479	3479	1638	2806	3931	2176	3590	5281
	24	975	1965	3009	1089	2165	3314	1358	2625	3931	2176	3590	5281
12	12	1237	2108	3099	1355	2385	3315	1632	2724	3794	2176	3590	5281
	16	1070	1991	2947	1186	2192	3252	1459	2663	3794	2176	3590	5281
	24	778	1664	2584	887	1855	2876	1149	2311	3555	2176	3590	5281

(1) Loads based on AISI Specifications for the Design of Cold Formed Steel Structural members, 1980 edition (except Sec. 5.1). Stresses increased 33% for uniform lateral loads. Loads assume studs are braced to resist minor axis bending and flange rotation by horizontal bracing

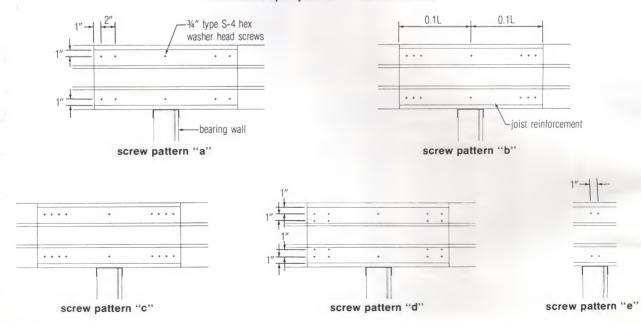
installed 36°° c.c. and/or properly attached approved facing materials. Values limited by: L/360 deflection, shown in black; L/240 deflection are followed by dagger (†).

		floor loa	ding (psf)										
size,	joist	10 dead,	20 live	10 dead,	30 live	10 dead,	40 live	10 dead,	50 live	20 dead,	40 live	20 dead,	100 live
style & gauge (2)	spac- ing (in)	1-span	2-span (3)	1-span	2-span (3)	1-span	2-span (3)	1-span	2-span (3)	1-span	2-span (3)	1-span	2-span (3
135SJ14	12	39-5	44-3	34-5	38-8	31-3	35-1	29-0	32-7	30-2	34-6	21-4	24-5b
	16	35-10	40-2	31-3	35-1	28-5	31-11	26-2	29-7	26-2	29-11	18-6	20-7b
	24	30-2	34-6	26-2	29-11	23-5	26-9b	21-4	24-5b	21-4	24-5b	15-1	15-4d
115SJ14	12	34-4	38-7	30-0	33-9	27-3	30-8	25-4	28-5	23-3	30-8	19-6	22-3b
	16	31-3	35-1	27-3	30-8	24-9	27-10	23-0	25-10	23-10	27-3	16-10	19-3b
	24	27-3	30-8	23-10	26-9	21-4	24-4	19-6	22-3b	19-6	22-3b	13-9	15-6d
115SJ16	12	32-0	35-11	28-0	31-5	25-5	28-6	23-7	26-6	23-7	27-0	16-8	17-6b
	16	28-11	32-8	25-0	28-6	22-5	25-7	20-5	23-3	20-5	23-3	14-5	14-0b
	24	23-7	27-0	20-5	23-3	18-3	19-11	16-8	17-6b	16-8	17-6b	11-5	10-0b
95SJ14	12	29-3	32-10	25-7	28-8	23-3	26-1	21-7	24-3	23-3	26-1	17-1	19-3
	16	26-7	29-10	23-3	26-1	21-1	23-8	19-7	22-0	21-1	23-8	15-1	17-2b
	24	23-3	26-1	20-4	22-9	18-5	20-8	17-1	19-3	17-5	19-10	12-3	14-1b
95SJ16	12	27-3	30-8	23-10	26-9	21-8	24-4	20-1	22-7	21-4	24-4	15-1	17-3b
	16	24-9	27-10	21-8	24-4	19-8	22-1	18-3	20-6	18-5	21-1	13-1	14-5b
	24	21-4	24-4	18-5	21-1	16-6	18-10	15-1	17-3b	15-1	17-3b	10-8	10-8b
925SJ14	12	28-7	32-2	25-0	28-1	22-9	25-6	21-1	23-8	22-9	25-6	16-9	18-10
	16	26-0	29-2	22-9	25-6	20-8	23-2	19-2	21-6	20-8	23-2	14-10	16-11b
	24	22-9	25-6	19-10	22-3	18-0	20-3	16-9	18-10	17-1	19-6	12-1	13-10be
925SJ16	12	26-8	29-11	23-4	26-2	21-2	23-9	19-8	22-1	21-0	23-9	14-10	17-0b
	16	24-3	27-3	21-2	23-9	19-3	21-7	17-10	20-1	18-2	20-9	12-10	14-5b
	24	21-0	23-9	18-2	20-9	16-3	18-7	14-10	17-0b	14-10	17-0b	10-6	10-9de
80SJ14	12	25-4	28-6	22-2	24-11	20-2	22-7	18-8	21-0	20-2	22-7	14-10	16-8
	16	23-1	25-11	20-2	22-7	18-4	20-7	17-0	19-1	18-4	20-7	13-6	15-2ae
	24	20-2	22-7	17-7	19-9	16-0	17-11	14-10	16-8	15-8	17-10	11-1	12-8be
80SJ16	12	23-8	26-7	20-8	23-2	18-9	21-1	17-5	19-7	18-9	21-1	13-8	15-6ae
	16	21-6	24-2	18-9	21-1	17-1	19-2	15-10	17-9	16-9	19-1	11-10	13-6be
	24	18-9	21-1	16-5	18-5	14-11	16-9	13-8	15-6	13-8	15-7ae	9-8	10-10de
75SJ14	12	24-1	27-0	21-0	23-7	19-1	21-5	17-9	19-11	19-1	21-5	14-1	15-10
	16	21-10	24-6	19-1	21-5	17-4	19-6	16-1	18-1	17-4	19-6	12-9	14-4ae
	24	19-1	21-5	16-8	18-9	15-2	17-0	14-1	15-10	15-0	17-0	10-7	12-1be
75SJ16	12	22-5	25-2	19-7	22-0	17-10	20-0	16-6	18-7	17-10	20-0	13-1	14-9ae
	16	20-5	22-10	17-10	20-0	16-2	18-2	15-0	16-10	16-1	18-2	11-5	13-0be
	24	17-10	20-0	15-7	17-6	14-2	15-10	13-1	14-9ae	13-2	15-0ae	9-4	10-8ce
725SJ14	12	23-5	26-3	20-5	22-11	18-7	20-10	17-3	19-4	18-7	20-10	13-8	15-4
	16	21-3	23-10	18-7	20-10	16-10	18-11	15-8	17-7	16-10	18-11	12-5	13-11ae
	24	18-7	20-10	16-3	18-3	14-9	16-7	13-8	15-4	14-8	16-7ae	10-4	11-10be
725SJ16	12	21-10	24-6	19-1	21-5	17-4	19-5	16-1	18-1	17-4	19-5	12-9	14-4ae
	16	19-10	22-3	17-4	19-5	15-9	17-8	14-7	16-5	15-9	17-8	11-2	12-9be
	24	17-4	19-5	15-2	17-0	13-9	15-5ae	12-9	14-4ae	12-11	14-9ae	9-1	10-5ce

(1) Based on allowable design stress or live-load deflection limitation of L/360, whichever is less. More stringent deflection criteria may be required for specific job conditions. (2) All joists must be checked for web crippling (see table for bearing/loads). (3) Joist rein-

forcing required for minimum distance of 0.1 span each side-total 0.2 span-of center support and screw attachment pattern "a", unless other pattern designated (see details below).

continuous span joist reinforcement details



Bracing load-bearing framing

Effective use of USG Steel Framing requires various types of bracing to obtain published performance values and adequately support design loads, particularly during construction.

lateral bracing of stud walls

Horizontal bracing provides lateral support for studs. It resists bending about the stud minor axis under axial loading and flange rotation under wind loading.

One common method of bracing consists of 11/2'' cold rolled channel inserted through stud holes and welded or screw-attached using a clip angle (see details). As an alternate, steel V-bracing and solid bridging are also acceptable. This horizontal bracing consists of solid bridging between studs at each end of wall, adjacent to wall openings and 8 ft. o.c. max.; and horizontal 11/2'' V-bracing screw-attached to both stud flanges and bridging.

Rigid facing materials—gypsum sheathing and interior gypsum boards—properly attached to both sides of studs will provide adequate lateral support. But finishing materials are not always applied to both sides of studs before wind loads, live and dead construction loads or both must be carried.

Values in axial combined load tables are based on laterally supported studs having horizontal steel bracing or cold rolled channels installed 36" o.c. or gypsum boards and sheathing properly attached to both stud flanges. For allowable loads for studs with other than 36" spacing, contact U.S.G.

bridging for joists

Lateral support to keep joists from twisting is provided by the plywood subfloor or deck material and bridging. This bridging consists of solid blocking and 1½" V-bracing screw-attached to bottom joists flanges. Joist bridging should be installed immediately after joists are erected and before construction loads are applied.

Solid blocking, a cut-to-length joist section, is placed between outer joists, over all interior supports, adjacent to openings and 8 ft. o.c. max. (see detail). Blocking is welded or screw-attached to joist webs using end clips. V-bracing of 1½" x 20-ga. galvanized steel is screw attached to bottom joist flange between solid blocking.

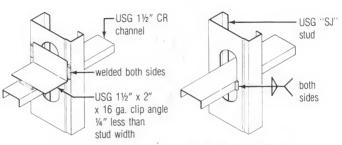
Joist bridging is recommended at mid-span or 8 ft. o.c. max. for spans exceeding 15 ft. Where subfloor or decking does not provide lateral support, top and bottom joist flanges must be properly braced at all bearing points and at intervals within spans to provide lateral support to flanges in compression.

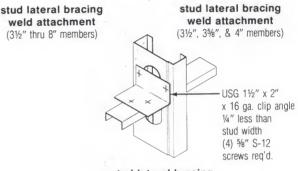
bracing during construction

Adequate lateral support, 11/2" cold rolled channels, rigid facing materials or horizontal bracing should be provided for walls immediately after studs are erected. This will help obtain published design loads and prevent overstressing studs and runners during following construction.

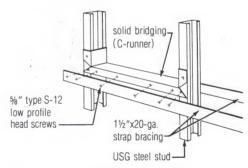
Without proper bracing, construction loads may cause stud walls to fail from: (1) weight of framing on upper floors, (2) gypsum board or other materials stored on upper floors, (3) concrete or other floor decking. If rigid facings have been applied to stud exterior but not the interior, improperly braced studs may fail from axial and/or negative wind loading.

Joists should have adequate lateral support provided immediately following erection to prevent flange rotation during construction and to support flanges in compression.

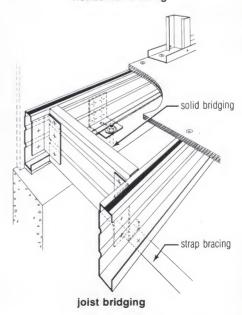




stud lateral bracing screw attachment (3½" thru 8" members)



horizontal bracing



allowable axial loads (1) when combined with... 15-psf wind load (80 mph)

table 6

SJ style stud

		allowal	ble comp	ressive l	oad per s	tud (1) (lb	.)									
stud clear height,	spacing	steelst	ud-secti	on desig	nation by	size, styl	e & gauge	•		`						
		31/2" stu	ud-35S	J			35/8" st	ud-3625	SJ			4" stud	—40SJ			51/2" stud
floor/celling un- braced ht (1) (ft)	spacing (in o.c.)	22	20	18	16	14	22	20	18	16	14	20	18	16	14	55SJ20
3	12 16 24	2035 1804 1384	2927 2668 2191	3979 3946 3409	5170 5170 4843	6341 6341 6318	2135 1908 1492	2996 2829 2360	4161 4161 3702	5388 5388 5203	6624 6624 6624	3109 3109 2668	4513 4513 4308	5865 5865 5865	7240 7240 7240	3326 3326 3326
)	12 16 24	1724 1460 994†	2518 2217 1688†	3710 3367 2763	4950 4722 4047	6070 6070 5390	1835 1571 1102†	2688 2390 1862†	4003 3663 3052	5179 5090 4412	6364 6364 5857	2996 2711 2194	4371 4282 3674	5675 5675 5234	7003 7003 6896	3326 3326 3142
10	12 16 24	1415† 1130† 641*	2103 1781† 1229*	3165 2794 2157†	4418 4000 3279†	5714 5259 4473	1529 1241† 741*	2282 1957† 1395†	3463 3084 2429†	4793 4369 3632	6073 5733 4931	2621 2298 1727†	4095 3712 3036	5463 5203 4448	6740 6740 5976	3326 3310 2812
11	12 16 24	1124† 832* 335*	1714† 1386* 831*	2642 2263† 1620*	3747 3316† 2585†	4903 4430 3626†	1236† 935* 421*	1891† 1554† 981*	2929 2535† 1865*	4115 3670 2911†	5378 4890 4056†	2242 1894† 1293*	3558 3144 2431†	4957 4491 3687†	6448 5944 5063	3300 3018 2435
12	12 16 24	864* 572*	1367* 1043* 496*	2169† 1793* 1161*	3129† 2702† 1982*	4144 3672† 2879*	969* 664* 149*	1534† 1196* 626*	2434† 2040† 1375*	3476 3028† 2273*	4596 4102 3269†	1877† 1518† 905*	3037 2610† 1885*	4291 3808 2985†	5646 5114 4206†	3041 2684 2031

Al/ill		51/2" stud	—55SJ (con	tinued)		6" stud-	-60SJ			8" stud-	-80SJ	
floor/ceiling un- braced ht (1) (ft)	spacing (in o.c.)	20	18	16	14	20	18	16	14	18	16	14
10	12	3326	4866	6754	8924	3372	4947	6866	9089	5178	7217	9628
	16	3310	4866	6754	8924	3372	4947	6866	9089	5178	7217	9628
	24	2812	4742	6754	8924	3027	4947	6866	9089	5178	7217	9628
11	12	3300	4828	6655	8796	3372	4947	6866	9089	5178	7217	9628
	16	3018	4828	6655	8796	3248	4947	6866	9089	5178	7217	9628
	24	2435	4290	6477	8796	2698	4676	6866	9089	5178	7217	9628
12	12	3041	4731	6509	8584	3303	4914	6774	8971	5178	7217	9628
	16	2684	4502	6509	8584	2963	4914	6774	8971	5178	7217	9628
	24	2031	3772	5819	8182	2331	4240	6511	8971	5178	7217	9628
14	12	2428	4074	6015	8103	2737	4567	6501	8573	5178	7217	9628
	16	2002	3594	5459	7589	2316	4097	6213	8573	5178	7217	9628
	24	1253†	2741†	4478	6461	1560†	3250	5262	7518	4663	7217	9628
16	12	1826†	3244	4890	6745	2151	3777	5701	7853	5170	7163	9565
	16	1366†	2715†	4280	6044	1676†	3238	5090	7148	4810	7163	9565
	24	577*	1811*	3237†	4847†	850*	2298†	4023†	5920	3922	6382	9335
18	12 16 24	1289* 820*	2479† 1943* 1037*	3845† 3228† 2187*	5361 4656† 3470*	1598† 1098* 244*	3005† 2435† 1461*	4664 4014† 2906*	6482 5735 4464†	4673 4104 3070	6975 6471 5337	9289 9289 8053
20	12 16 24	838* 377*	1826* 1303* 366*	2944† 2346° 1342°	4167† 3491° 2356*	1110* 605*	2309† 1735* 766*	3713† 3061* 1961*	5223† 4478† 3225*	4023 3382 2242†	6269 5557 4291†	8936 8147 6741

CS style stud

		allowab	e compress	ive load per	stud (1) (lb.)							
stud clear height,	spacing	steel stu	d-section d	esignation l	by size, style	e & gauge							
floor/ootling	annaina.	31/2" stud	1—35CS		35/8" stu	d-362CS		4" stud-	-40CS		6" stud-	-60CS	
floor/celling un- braced ht (1) (ft)	spacing (in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
8	12 16 24	1291 1070 662	2477 2242 1801	3474 3474 3019	1393 1176 770	2577 2409 1973	3616 3616 3265	1630 1419 1020	2806 2786 2363	3931 3931 3805	2176 2176 2027	3590 3590 3590	5281 5281 5281
9	12 16 24	1079 817 345†	2217 1928 1409	3436 3118 2548	1185 924 450	2388 2101 1581	3616 3369 2801	1430 1172 696	2773 2494 1979	3931 3916 3364	2176 2146 1789	3590 3590 3590	5281 5281 5281
10	12 16 24	851 557†	1908 1581 1010†	3035 2672 2041†	963 666 140†	2102 1769 1185†	3328 2960 2313	1212 911 370†	2501 2170 1575	3892 3531 2883	2176 1960 1524	3590 3590 3344	5281 5281 5281
11	12 16 24	619† 308†	1568 1224† 633*	2568 2187† 1535†	727 408†	1758 1403† 790†	2860 2466 1788†	983 648	2204 1830 1175†	3524 3110 2388†	2025 1755 1239	3590 3570 3020	5281 5281 5099
12	12 16 24	407†	1253† 902† 306*	2131† 1745† 1093*	504† 173*	1429† 1063† 440*	2405 2001† 1315*	744 388†	1856 1460† 780*	3051 2613 1863†	1848 1532 939	3590 3311 2669	5281 5281 4682
14	12 16 24		725* 381*	1395* 1025* 403*	126*	866° 502°	1618† 1224* 562*	315†	1220† 813* 127*	2166† 1723† 975*	1455 1054 325†	3173 2728 1919	5186 4678 3757
16	12 16 24		335*	845* 505*		439*	1018* 652*		712* 318*	1455* 1032* 324*	1035 565†	2628 2098 1168†	4476 3863 2793

(1) Loads based on AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition (except Sec. 5.1). Stresses increased 33% for wind loads. Loads assume studs are braced to resist minor axis bending and flange rotation by horizontal bracing installed

 36° o.c. and/or properly attached approved facing materials. Values limited by: L/360 deflection, shown in black; L/240 deflection are followed by dagger (†). L/120 deflection are followed by asterisk (*).

allowable axial loads (1) when combined with... 20-psf wind load (90 mph)

table 7

SJ style stud

		allowal	ole comp	ressive l	oad per s	stud (1) (lb	.)									
stud clear height,	spacing	steel st	ud-secti	on desig	nation by	y size, styl	e & gauge	9								
		31/2" stu	ud—35S	J			35/8" sti	ud—3629	SJ			4" stud	-40SJ			51/2" stud
floor/ceiling un- braced ht (1) (ft)	spacing (in o.c.)	22	20	18	16	14	22	20	18	16	14	20	18	16	14	55SJ20
8	12 16 24	1804 1518 1007†	2668 2344 1764†	3946 3581 2926	5170 5033 4308	6341 6341 5749	1908 1626 1115†	2828 2510 1937	4161 3873 3216	5388 5388 4670	6624 6624 6208	3106 2811 2260	4513 4475 3833	5865 5865 5478	7240 7240 7221	3326 3326 3122
9	12 16 24	1460 1142† 587*	2217 1855† 1228*	3367 2954 2235†	4722 4261 3453	6070 5621 4747	1571 1251† 689*	2390 2030 1398†	3663 3246 2513†	5090 4628 3810	6364 6090 5208	2711 2359 1729†	4282 3869 3127	5675 5449 4628	7003 7003 6247	3326 3276 2751
10	12 16 24	1130† 795* 220*	1781† 1403† 757*	2794 2357† 1611*	4000 3506 2660†	5259 4721 3795†	1241† 898* 308*	1957† 1572† 911*	3084 2635† 1863†	4369 3865 2994†	5733 5185 4234†	2298 1908† 1227†	3712 3250 2443†	5203 4688 3783	6740 6236 5253	3310 2974 2342
11	12 16 24	832* 490*	1386* 1005* 360*	2263† 1821* 1074*	3316† 2814† 1964*	4430 3877† 2942*	935* 582*	1554† 1160* 493*	2535† 2075† 1294*	3670 3149† 2264*	4890 4317 3343†	1894† 1482† 775*	3144 2656† 1818*	4491 3940 2992†	5944 5341 4300†	3018 2624 1898
12	12 16 24	572* 232*	1043* 667*	1793* 1358* 627*	2702† 2207* 1374*	3672† 3126† 2208*	664* 310*	1196* 804* 144*	2040† 1582* 812*	3028† 2509† 1634*	4102 3529† 2563*	1518† 1097* 383*	2610† 2112† 1269*	3808 3243† 2284*	5114 4490† 3431†	2684 2240 1442†

	haratan.	51/2" stud	—55SJ (con	tinued)		6" stud-	60SJ			8" stud-	80SJ	
floor/ceiling un- braced ht (1) (ft)	spacing (in o.c.)	20	18	16	14	20	18	16	14	18	16	14
10	12 16 24	3310 2974 2342	4866 4866 4229	6754 6754 6488	8924 8924 8924	3372 3178 2587	4947 4947 4579	6866 6866	9089 9089 9089	5178 5178 5178	7217 7217 7217	9628 9628 9628
11	12 16 24	3018 2624 1898	4828 4499 3693	6655 6655 5804	8796 8796 8250	3248 2877 2182	4947 4870 4116	6866 6866 6452	9089 9089 9083	5178 5178 5157	7217 7217 7217	9628 9628 9628
12	12 16 24	2684 2240 1442†	4502 4007 3110	6509 6086 5065	8584 8487 7320	2963 2536 1750	4914 4465 3598	6774 6758 5801	8971 8971 8296	5178 5178 4802	7217 7217 7217	9628 9628 9628
14	12 16 24	2002† 1490† 600*	3594 3012† 1995†	5459 4789 3619†	7589 6818 5474†	2316 1801† 889†	4097 3520 2493†	6213 5566 4411	8573 7867 6541	5178 4892 3998	7217 7217 6547	9628 9628 9569
16	12 16 24	1366† 824*	2715† 2095* 1038*	4280 3564† 2345*	6044 5222† 3824*	1676† 1111* 134*	3238 2595† 1484*	5090 4360† 3098†	7148 6308 4856†	4810 4209 3101	7163 6693 5492	9565 9565 8365
18	12 16 24	820* 275*	1943* 1320* 270*	3228† 2512* 1305*	4656† 3840* 2467*	1098* 511*	2435† 1766* 631*	4014† 3254† 1962*	5735 4862† 3382*	4104 3401 2139†	6471 5702 4312	9289 8454 6922
20	12 16 24	377*	1303* 697*	2346* 1655*	3491* 2709* 1399*	605*	1735* 1068*	3061* 2305* 1031*	4478† 3616* 2165*	3382 2604† 1240*	5557 4694 3175†	8147 7188 5499†

CS style stud

		allowab	e compress	ive load per	stud (1) (lb.)							
stud clear height,	spacing	steel stu	d-section d	esignation l	by size, style	e & gauge							
		31/2" stu	d-35CS		35/8" stu	d-362CS		4" stud-	-40CS		6" stud-	-60CS	
floor/ceiling un- braced ht (1) (ft)	spacing (in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
8	12 16 24	1070 794 288	2242 1944 1397	3474 3173 2582	1176 901 396	2409 2114 1570	3616 3417 2833	1419 1150 646	2786 2501 1967	3931 3931 3386	2176 2121 1749	3590 3590 3590	5281 5281 5281
9	12 16 24	817 496	1928 1574 947†	3118 2730 2041†	924 602	2101 1748 1115†	3369 2983 2292	1172 849 261†	2494 2145 1508	3916 3542 2858	2146 1907 1441	3590 3590 3275	5281 5281 5281
10	12 16 24	557† 206†	1581 1190† 515*	2672 2240 1494†	666 307†	1769 1370† 674†	2960 2518 1749	911 543	2170 1765 1046†	3531 3090 2305†	1960 1668 1105	3590 3495 2903	5281 5281 4993
11	12 16 24	308†	1224† 818† 126*	2187† 1739† 978*	408†	1403† 982† 262*	2466 2001† 1206*	648 245†	1830 1382† 605*	3110 2616 1760†	1755 1407 751	3570 3200 2499	5281 5281 4523
12	12 16 24		902† 493*	1745† 1297* 540*	173*	1063† 635*	2001† 1530† 733*	388†	1460† 994† 196*	2613 2098† 1220*	1532 1131 387	3311 2878 2071	5281 4915 4014
14	12 16 24		381*	1025* 597*		502*	1224* 769*		813* 341*	1723† 1208* 343*	1054 558	2728 2178 1193†	4678 4052 2932
16	12 16 24			505*			652*		318*	1032* 544*	565†	2098 1462† 358*	3863 3131† 1866†

(1) Loads based on AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition (except Sec. 5.1). Stresses increased 33% for wind loads. Loads assume studs are braced to resist minor axis bending and flange rotation by horizontal bracing installed

 $36^{\prime\prime}$ o.c. and/or properly attached approved facing materials. Values limited by: L/360 deflection, shown in black; L/240 deflection are followed by dagger (†). L/120 deflection are followed by asterisk (*).

allowable axial loads (1) when combined with... 25-psf wind load (100 mph)

table 8

SJ style stud

		allowal	ole comp	ressive l	oad per s	stud (1) (lb	.)									
stud clear height,	spacing	steelst	ud-secti	on desig	nation b	y size, styl	e & gauge	•		`						
flaar/asiliaa ua		31/2" stu	ıd—35S	J			35/8" sti	ud-3629	SJ			4" stud	—40SJ			51/2" stud
floor/ceiling un- braced ht (1) (ft)	spacing (in o.c.)	22	20	18	16	14	22	20	18	16	14	20	18	16	14	55SJ20
8	12 16 24	1587 1254† 662*	2422 2044 1374†	3670 3243 2482†	5130 4659 3815	6341 6123 5220	1694 1362 768†	2588 2215 1548†	3961 3535 2768	5388 5020 4176	6624 6580 5681	2884 2528 1878	4513 4146 3388	5865 5819 4991	7240 7240 6706	3326 3326 2817
9	12 16 24	1218† 853† 220*	1942† 1529† 815*	3054 2580† 1759†	4372 3841 2917†	5741 5168 4164†	1328† 959† 314*	2116 1701† 978*	3347 2866 2025†	4740 4204 3264†	6209 5633 4615	2445 2034 1304†	3969 3486 2625†	5559 5026 4070	7003 6673 5646	3326 3010 2374
10	12 16 24	875* 494*	1493† 1065* 337*	2461† 1967† 1125*	3624 3064† 2108*	4849 4237 3189†	980† 590*	1664† 1227* 479*	2742 2232† 1359*	3985 3411† 2424†	5316 4689 3609†	2002 1554† 776*	3361 2830† 1909†	4812 4218 3182†	6370 5726 4596†	3057 2652 1898
11	12 16 24	572* 187*	1095* 666*	1926† 1430* 592*	2933† 2368* 1415*	4009† 3387† 2336*	667* 268*	1254* 811*	2184† 1666* 789*	3273† 2685† 1690*	4454 3807† 2711*	1580† 1113* 313*	2772† 2218† 1271*	4072 3445† 2372*	5485 4798 3617†	2720 2251 1397†
12	12 16 24	313*	756* 335*	1461* 975*	2324* 1770* 838*	3256† 2644* 1616*	394*	897* 458*	1691* 1178* 315*	2632† 2050* 1070*	3665† 3022† 1939*	1197* 723*	2231† 1670* 722*	3377† 2740† 1662*	4639 3936† 2744*	2348 1828 900†

floor/ceiling un-	spacing	51/2" stud	-55SJ (con	tinued)		6" stud-	60SJ			8" stud-	80SJ	
braced ht (1) (ft)	(in o.c.)	20	18	16	14	20	18	16	14	18	16	14
10	12 16 24	3057 2652 1898	4866 4568 3741	6754 6754 5939	8924 8924 8459	3255 2878 2165	4947 4890 4126	6866 6866 6488	9089 9089 9089	5178 5178 5137	7217 7217 7217	9628 9628 9628
11	12 16 24	2720 2251 1397†	4605 4086 3134	6655 6247 5171	8796 8754 7530	2968 2523 1694	4947 4486 3584	6866 6859 5865	9089 9089 8421	5178 5178 4746	7217 7217 7217	9628 9628 9628
12	12 16 24	2348 1828 900†	4128 3545 2498†	6223 5561 4368	8584 7887 6523	2640 2132 1208†	4579 4021 2998	6774 6269 5135	8971 8828 7537	5178 5133 4316	7217 7217 6921	9628 9628 9628
14	12 16 24	1613† 1027*	3152 2483† 1324*	4950 4180† 2846†	7003 6119 4586†	1925 1329† 280*	3660 2989† 1804†	5723 4969 3633†	8047 7182 5648†	5007 4437 3362	7217 7017 5866	9628 9628 8838
16	12 16 24	953* 341*	2243† 1542* 350*	3735† 2926* 1553*	5418† 4490† 2917*	1246† 601*	2749† 2015† 754*	4535 3702† 2269*	6509 5551† 3904†	4356 3641 2334†	6851 6079 4655	9565 9005 7451
18	12 16 24	405*	1468* 769*	2682* 1879* 527*	4034† 3119* 1581*	651*	1925* 1172*	3435† 2577† 1124*	5070† 4087† 2424*	3572 2750† 1287†	5888 4985 3368†	8660 7665 5878†
20	12 16 24		841*	1819* 1046*	2895* 2021*	158*	1227* 479*	2484* 1636*	3820* 2855* 1231*	2791† 1895† 336*	4902 3905 2164*	7420 6312 4375†

CS style stud

		allowab	le compress	sive load per	stud (1) (lb.)							
stud clear height,	spacing	steel stu	ud-section d	esignation	by size, style	e & gauge							
floor/ceiling un-	spacing	31/2" stu	d-35CS		35/8" stu	d-362CS		4" stud-	-40CS		6" stud-	-60CS	
braced ht (1) (ft)	(in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
8	12 16 24	861 534	2016 1663 1022†	3252 2870 2176	968 642	2187 1835 1194	3494 3118 2427	1216 893 293	2571 2228 1591	3931 3663 2989	2168 1934 1475	3590 3590 3325	5281 5281 5281
9	12 16 24	573 200†	1660 1249† 527†	2824 2373 1580†	680 304†	1833 1421 689†	3077 2626 1826†	928 547	2230 1817 1072†	3633 3191 2388	1966 1672 1102	3590 3514 2922	5281 5281 5034
10	12 16 24	290†	1284† 838†	2344 1851† 1004*	393†	1466 1008† 215*	2624 2118† 1242*	632 204†	1863 1393† 565†	3196 2683 1779†	1740 1383 702	3571 3195 2477	5281 5281 4528
11	12 16 24		915† 456*	1846† 1341* 484*	119†	1083† 606*	2112† 1585† 688*	342†	1489† 977†	2734 2170† 1197*	1493 1073 287	3291 2843 2001	5281 4904 3973
12	12 16 24		590* 130*	1403* 900*		737* 255*	1642† 1112* 217*		1105† 577*	2221† 1639† 649*	1229 750	2984 2465 1508	5033 4454 3384
14	12 16 24			698* 219*		181*	877* 367*		454*	1330* 754*	678	2311 1669 528†	4204 3473 2177
16	12 16 24						245*			660*	136†	1615† 887†	3306 2471 1035

(1) Loads based on AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition (except Sec. 5.1). Stresses increased 33% for wind loads. Loads assume studs are braced to resist minor axis bending and flange rotation by horizontal bracing installed

 $36^{\prime\prime}$ o.c. and/or properly attached approved facing materials. Values limited by: L'360 deflection, shown in black; L'240 deflection are followed by dagger (†), L'120 deflection are followed by asterisk (*).

allowable axial loads (1) when combined with... 30-psf wind load (110 mph)

table 9

SJ style stud

		allowal	ble comp	ressive l	oad per s	stud (1) (lb	.)									
stud clear height,	spacing	steelst	ud-secti	on desig	nation by	y size, styl	e & gauge									
		31/2" stu	ud—35S	J			35/8" stu	ud-3629	SJ			4" stud	-40SJ			51/2" stud
floor/ceiling un- braced ht (1) (ft)	spacing (in o.c.)	22	20	18	16	14	22	20	18	16	14	20	18	16	14	55SJ20
8	12 16 24	1384 1007† 342*	2191 1764† 1013*	3409 2926 2070†	4843 4308 3355†	6318 5749 4726	1492 1115† 444*	2360 1937 1185†	3702 3216 2350†	5203 4670 3713	6624 6208 5184	2668 2260 1519†	4308 3833 2967	5865 5478 4529	7240 7221 6214	3326 3122 2519
9	12 16 24	994† 587*	1688† 1228† 437*	2763 2235† 1323*	4047 3453 2425†	5390 4747 3627†	1102† 689*	1862† 1398† 593*	3052 2513† 1576*	4412 3810 2760†	5857 5208 4067	2194 1729† 909*	3674 3127 2159†	5234 4628 3550†	6896 6247 5084	3142 2751 2011
10	12 16 24	641* 220*	1229* 757*	2157† 1611* 683*	3279† 2660† 1606*	4473 3795† 2637*	741* 308*	1395† 911*	2429† 1863† 899*	3632 2994† 1903*	4931 4234† 3037†	1727† 1227† 362*	3036 2443† 1419*	4448 3783 2629†	5976 5253 3991†	2812 2342 1474
11	12 16 24	335*	831* 360*	1620* 1074* 154*	2585† 1964* 917*	3626† 2942* 1787*	421*	981* 493*	1865* 1294* 330*	2911† 2264* 1169*	4056† 3343† 2136*	1293* 775*	2431† 1818* 773*	3687† 2992† 1807*	5063 4300† 2994*	2435 1898 926†
12	12 16 24		496*	1161* 627*	1982* 1374* 214*	2879* 2208* 1080*	149*	626* 144*	1375* 812*	2273* 1634* 559*	3269† 2563* 1374*	905* 383*	1885* 1269* 227*	2985† 2284* 1099*	4206† 3431† 2120*	2301 1442† 397*

		51/2" stud	—55SJ (con	tinued)		6" stud-	60SJ			8" stud-	80SJ	
floor/ceiling un- braced ht (1) (ft)	spacing (in o.c.)	20	18	16	14	20	18	16	14	18	16	14
10	12 16 24	2812 2342 1474	4742 4229 3275	6754 6488 5413	8924 8924 7865	3027 2587 1759	4947 4579 3688	6866 6866 6010	9089 9089 8613	5178 5178 4801	7217 7217 7217	9628 9628 9628
11	12 16 24	2435 1898 926†	4290 3693 2606†	6477 5804 4573	8796 8250 6849	2698 2182 1231†	4676 4116 3076	6866 6452 5303	9089 9083 7785	5178 5157 4341	7217 7217 6961	9628 9628 9628
12	12 16 24	2031 1442† 397*	3772 3110 1929†	5819 5065 3716†	8182 7320 5777	2331 1750 699†	4240 3598 2431†	6511 5801 4504	8971 8296 6818	5178 4802 3841	7217 7217 6421	9628 9628 9472
14	12 16 24	1253† 600*	2741† 1995* 708*	4478 3619† 2136*	6461 5474† 3772†	1560† 889†	3250 2493† 1167*	5262 4411 2912†	7518 6541 4821†	4663 3998 2752	7217 6547 5209	9628 9569 8131
16	12 16 24	577*	1811* 1038*	3237† 2345* 833*	4847† 3824* 2094*	850* 134*	2298† 1484*	4023† 3098† 1511*	5920 4856† 3034*	3922 3101 1611†	6382 5492 3864†	9335 8365 6583
18	12 16 24		1037* 270*	2187* 1305*	3470* 2467* 780*	244*	1461* 631*	2906* 1962* 363*	4464† 3382* 1554*	3070 2139† 495*	5337 4312 2489†	8053 6922 4905
20	12 16 24		366*	1342*	2356* 1399*		766*	1961* 1031*	3225* 2165*	2242† 1240*	4291† 3175† 1235*	6741 5499† 3339*

CS style stud

		allowab	le compress	ive load per	stud (1) (lb.)							
stud clear height,	spacing	steel stu	ıd-section d	esignation l	by size, styl	e & gauge							
	4 4	31/2" stu	d-35CS		35/8" stu	d-362CS		4" stud-	-40CS		6" stud-	-60CS	
floor/ceiling un- braced ht (1) (ft)	spacing (in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
8	12 16 24	662 288	1801 1397 670†	3019 2582 1795†	770 396	1973 1570 839†	3265 2833 2045	1020 646	2363 1967 1234	3805 3386 2610	2027 1749 1205	3590 3590 3048	5281 5281 5186
9	12 16 24	345†	1409 947† 140*	2548 2041† 1155†	450	1581 1115† 294*	2801 2292 1393†	696 261†	1979 1508 664†	3364 2858 1947†	1789 1441 771	3590 3275 2577	5281 5281 4661
10	12 16 24		1010† 515*	2041† 1494† 556*	140†	1188† 674†	2313 1749† 777*	370†	1575 1046† 121*	2883 2305† 1294†	1524 1105 312	3344 2903 2064	5281 4993 4076
11	12 16 24		633* 126*	1535† 978*		790† 262*	1788† 1206* 217*		1175† 605*	2388† 1760† 683*	1239 751	3020 2499 1525	5099 4523 3445
12	12 16 24		306*	1093* 540*		440*	1315* 733*		780* 196*	1863† 1220* 130*	939 387	2669 2071 975†	4682 4014 2788
14	12 16 24						562*		127*	975*† 343*	325†	1919 1193†	3757 2932 1476
16	12 16 24									324*		1168† 358*	2793 ⁻ 1866 ⁻ 276*

⁽¹⁾ Loads based on AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition (except Sec. 5.1). Stresses increased 33% for wind loads. Loads assume studs are braced to resist minor axis bending and flange rotation by horizontal bracing installed

 36° o.c. and/or properly attached approved facing materials. Values limited by: L/360 deflection, shown in black; L/240 deflection are followed by dagger (†). L/120 deflection are followed by asterisk (*).

allowable axial loads (1) when combined with... 35-psf wind load (120 mph)

table 10

SJ style stud

		allowa	ble comp	ressive l	oad per s	stud (1) (lb	.)									
stud clear height,	spacing	steel st	lud-secti	on desig	nation b	y size, sty	le & gaug	е		\ \						
floor/ceiling un-	encelna	31/2" sti	ud—35S	J			35/8" st	ud-362	SJ			4" stud	-40SJ			51/2" stud
braced ht (1) (ft)	spacing (in o.c.)	22	20	18	16	14	22	20	18	16	14	20	18	16	14	55SJ20
8	12 16 24	1191† 774†	1972 1501† 675*	3162 2626 1683†	4570 3975 2923†	6028 5392 4259	1299† 881† 140*	2144 1674† 845*	3454 2914 1956†	4931 4337 3275	6485 5853 4714	2460 2003 1178†	4067 3533 2568†	5732 5150 4088	7240 6875 5744	3277 2918 2228
9	12 16 24	785* 339*	1451† 948*	2491† 1913† 918*	3741 3090† 1967*	5060 4353 3127†	890† 435*	1623† 1114* 234*	2775 2183† 1158*	4103 3441† 2290†	5524 4807 3554	1956 1442† 540*	3394 2788† 1723†	4925 4252 3061†	6565 5842 4554	2944 2498 1659
10	12 16 24	424*	985* 472*	1875† 1281* 274*	2960† 2286* 1141*	4123† 3384† 2126*	517*	1146* 618*	2137† 1521* 473*	3303† 2608† 1421*	4752 3810† 2507*	1470† 922*	2731† 2802† 964*	4107 3376† 2115*	5604 4809 3427†	2574 2043 1069
11	12 16 24	116*	587*	1338* 747*	2264* 1591* 458*	3272† 2531* 1281*	194*	729* 199*	1570* 951*	2576† 1875* 689*	3688† 2914* 1606*	1026* 462*	2115† 1447* 313*	3328† 2572† 1284*	4670 3837† 2417*	2161 1560† 480*
12	12 16 24		257*	885* 308*	1667* 1010*	2531* 1806* 587*		377*	1084* 475*	1943* 1251*	2903* 2139* 854*	635*	1566* 898*	2622† 1862* 579*	3805† 2965* 1544*	1729† 1076†
floor/ceiling un-	spacing	51/2" st	ud55S	J (contin	ued)		6	stud—6	i0SJ				8" st	ud—80S	J	
hraced bt (1) (ft)	(In o.c.)	20	18		16	14	2	0	18	16		14	18	1	6	14

floor/ceiling un-	anaalna	51/2" stud	—55SJ (con	tinued)		6" stud-	60SJ			8" stud-	8 0S J	
braced ht (1) (ft)	spacing (In o.c.)	20	18	16	14	20	18	16	14	18	16	14
10	12 16 24	2574 2043 1069†	4482 3902 2826	6754 6120 4907	8924 8662 7293	2805 2304 1367	4811 4275 3263	6866 6651 5546	9089 9089 8092	5178 5178 4468	7217 7217 7105	9628 9628 9628
11	12 16 24	2161 1560† 480*	3986 3317 2106†	6135 5378 4004	8626 7765 6200	2436 1854 788†	4393 3759 2588	6756 6058 4762	9089 8638 7173	5178 4882 3943	7217 7217 6545	9628 9628 9619
12	12 16 24	1729 1076†	3434 2697† 1393*	5434 4594 3102†	7742 6782 5075†	2035 1385† 218*	3914 3194 1893†	6150 5353 3903†	8693 7785 6132	5050 4476 3378	7217 7090 5931	9628 9628 8953
14	12 16 24	917* 202*	2358† 1541* 136*	4036† 3095† 1477*	5953 4873† 3016*	1216† 477*	2862† 2028† 571*	4826 3885† 2237*	7018 5938 4047†	4326 3571 2166	6899 6090 4574	9628 9079 7447
16	12 16 24	228*	1412* 571*	2776* 1808* 168*	4318† 3209* 1334*	481*	1879* 990*	3547† 2536* 808*	5372† 4211† 2228*	3504 2584 925†	5929 4929 3111†	8842 7750 5757
18	12 16 24		640*	1731* 777*	2951* 1866*		1032* 131*	2418* 1393*	3905* 2732* 752*	2594† 1564†	4813 3675† 1664°	7475 6218 3990†
20	12 16 24			903*	1860* 640*		341*	1480* 473*	2676* 1531*	1727† 628*	3717† 2491* 369*	6103† 4739† 2375*

CS style stud

		allowab	le compress	sive load per	stud (1) (lb.)							
stud clear height,	spacing	steelstu	ıd-section o	lesignation	by size, style	e & gauge							
floor/ceiling un-	spacing	31/2" stu	d-35CS		35/8" stu	d-362CS		4" stud-	-40CS		6" stud-	-60CS	
braced ht (1) (ft)	(in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
8	12 16 24	471	1595 1144 338†	2797 2309 1434†	580 161†	1768 1317 503†	3045 2560 1682†	830 409	2162 1714 893†	3593 3120 2247	1887 1565 940	3590 3418 2775	5281 5281 4894
9	12 16 24	130†	1172† 663†	2288 1729† 758*	233†	1343 827†	2540 1977† 988*	474	1739 1214 279†	3106 2541 1531†	1614 1214 449	3454 3039 2239	5281 5160 4295
10	12 16 24		755† 214*	1759† 1162* 142*		922† 363*	2023† 1406† 346*	123†	1304† 721†	2586 1950† 840°	1313 835	3122 2617 1664	5232 4681 3637
11	12 16 24		371*	1247* 643*		517*	1487† 855*		882† 259*	2064† 1379* 206*	991 439	2756 2164 1067	4808 4154 2937
12	12 16 24			807* 208*		166*	1014* 383*		478*	1531* 833*	658	2365 1692 468†	4343 3590 2220
14	12 16 24						273*			648*		1547† 744†	3335 2422 821*
16	12 16 24											751*	2315 1303

⁽¹⁾ Loads based on AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition (except Sec. 5.1). Stresses increased 33% for wind loads. Loads assume studs are braced to resist minor axis bending and flange rotation by horizontal bracing installed

^{36&}quot; o.c. and/or properly attached approved facing materials. Values limited by: L/360 deflection, shown in black; L/240 deflection are followed by dagger (†). L/120 deflection are followed by asterisk (*).

allowable axial loads (1) when combined with... 40-psf wind load (125 mph)

table 11

SJ style stud

		allowal	ole comp	ressive l	oad per s	stud (1) (lb	.)									
stud clear height,	spacing	steel st	ud-secti	on desig	nation b	y size, styl	e & gauge	•								
		31/2" stu	ud35S	J			35/8" sti	ud-362	SJ			4" stud	-40SJ			51/2" stud
floor/celling un- braced ht (1) (ft)	spacing (in o.c.)	22	20	18	16	14	22	20	18	16	14	20	18	16	14	55SJ20
8	12 16 24	1007† 553*	1764† 1251† 356*	2926 2341† 1318*	4308 3659 2513†	5749 5052 3816†	1115† 658†	1937 1424† 522*	3216 2626 1583†	4670 4019 2859†	6208 5512 4265	2260 1756† 853†	3833 3245 2186†	5478 4834 3666	7221 6539 5292	3122 2717 1943
9	12 16 24	587* 105*	1228* 685*	2235† 1610* 539*	3453 2749† 1537*	4747 3980† 2657*	689* 197*	1398† 846*	2513† 1872† 766*	3810 3092† 1847*	5208 4428 3071†	1729† 1169† 190*	3127 2466† 1310*	4628 3893 2599†	6247 5455 4051†	2751 2252 1319
10	12 16 24	220*	757* 205*	1611* 973*	2660† 1936* 708*	3795† 3000† 1649*	308*	911* 344*	1863† 1201*	2994† 2246* 970*	4234† 3413† 2011*	1227† 635*	2443† 1741* 537*	3783 2993† 1631*	5253 4390† 2896†	2342 1754 680†
11	12 16 24		360*	1074* 442*	1964* 1244*	2942* 2148* 809*		493*	1294* 631*	2264* 1511* 241*	3343† 2513* 1111*	775* 169*	1818* 1100*	2992† 2178* 795*	4300† 3404† 1877*	1898 1237†
12	12 16 24			627*	1374* 671*	2208* 1432*		144*	812*	1634* 894*	2563* 1745* 370*	383*	1269* 552*	2284* 1469*	3431† 2529* 1007*	1442† 729*

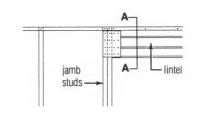
		51/2" stud	-55SJ (con	tinued)		6" stud-	-60SJ			8" stud-	80SJ	
floor/celling un- braced ht (1) (ft)	spacing (In o.c.)	20	18	16	14	20	18	16	14	18	16	14
10	12 16 24	2342 1754 680†	4229 3584 2395†	6488 5762 4418	8924 8258 6740	2587 2028 988†	4579 3978 2852	6866 6327 5094	9089 8968 7585	5178 5025 4139	7217 7217 6763	9628 9628 9628
11	12 16 24	1898 1237†	3693 2955 1628†	5804 4969 3460†	8250 7299 5580	2182 1537 364†	4116 3412 2119†	6452 5675 4240	9083 8206 6582	5157 4610 3552	7217 7217 6135	9628 9628 9187
12	12 16 24	1442† 729*	3110 2304† 885*	5065 4146 2520†	7320 6269 4409†	1750 1035†	3598 2805 1380†	5801 4921 3329†	8296 7293 5477	4802 4156 2825	7217 6753 5450	9628 9628 8443
14	12 16 24	600*	1995† 1113*	3619† 2603* 859*	5474† 4307† 2307*	889†	2493† 1587*	4411 3387† 1601*	6541 5366† 3317†	3998 3156 1599†	6547 5644 3960	9569 8600 6783
16	12 16 24		1038* 136*	2345° 1306°	3824* 2635* 625*	134*	1484* 526*	3098† 2009* 151*	4856† 3606* 1474*	3101 2088† 272*	5492 4387 2391†	8365 7157 4965†
18	12 16 24		270*	1305* 286*	2467* 1306*		631*	1962* 863*	3382* 2125*	2139† 1017*	4312 3069† 883*	6922 5547† 3123*
20	12 16 24				1399*			1031*	2165* 940*	1240*	3175† 1846*	5499† 4021† 1468*

CS style stud

		allowab	le compres	sive load per	stud (1) (lb	.)							
stud clear height,	spacing	steel st	ud-section o	designation	by size, styl	e & gauge					,		
		31/2" stu	d-35CS		35/8" stu	id-362CS		4" stud-	-40CS		6" stud-	-60CS	
floor/ceiling un- braced ht (1) (ft)	spacing (in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
8	12 16 24	288	1397 902†	2582 2046 1091†	396	1570 1073 183†	2833 2298 1335†	646 180	1967 1470 565†	3386 2861 1898	1749 1384 678	3590 3232 2505	5281 5281 4605
9	12 16 24		947† 395*	2041† 1435† 384*		1115† 544†	2292 1678† 606*	261†	1508 933†	2858 2238 1135†	1441 991 133	3275 2806 1909	5281 4909 3937
10	12 16 24		515*	1494† 851*		674†	1749† 1083*		1046† 414*	2305† 1614† 413*	1105 571	2903 2338 1275	4993 4376 3210
11	12 16 24		126*	978* 330*		262*	1206* 527*		605*	1760† 1021*	751 137	2499 1840 625†	4523 3795 2447
12	12 16 24			540*			733*		196*	1220* 471*	387	2071 1327	4014 3182 1676
14	12 16 24									343*		1193† 317†	2932 1938 202*
16	12 16 24											358*	1866† 775*

⁽¹⁾ Loads based on AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition (except Sec. 5.1). Stresses increased 33% for wind loads. Loads assume studs are braced to resist minor axis bending and flange rotation by horizontal bracing installed

 $36^{\prime\prime}$ o.c. and/or properly attached approved facing materials. Values limited by: L/360 deflection, shown in black; L/240 deflection are followed by dagger (†). L/120 deflection are followed by asterisk (*).





464

341

633

465

760

558

Lintel

12

14

allowable uniform loads (1)

sect. A-A

table 12

allowat	ole uniform	load (1) (lb	/ft)										
lintel c	omponent s	ection des	ignation by s	ize, style a	nd gauge								
51/2" joi	st-55SJ			6" joist	-60SJ			71/4" jois	st-725SJ		71/2" jois	t-75SJ	
20	18	16	14	20	18	16	14	18	16	14	18	16	14
721	1335	1748	2150	659	1477	1982	2438	1286	2494	3212	1242	2440	3376
411	593	777	956	439	656	881	1084	811	1109	1428	828	1154	1500
231	325	413	508	253	369	495	609	456	624	803	473	649	844
127	166	211	260	156	205	261	322	292	399	512	303	415	540
73	96	122	150	90	119	151	186	189	240	296	205	261	322
46	61	77	95	57	75	95	117	119	151	187	129	165	203
	lintel c 5½" joi 20 721 411 231 127 73	lintel component s 51%" joist-55SJ 20	Iintel component section des 51%" joist-55SJ 20	5\%" joist-55SJ 20 18 16 14 721 1335 1748 2150 411 593 777 956 231 325 413 508 127 166 211 260 73 96 122 150	Section Sect	Size	Size	Similar Simi	Simple Component section designation by size, style and gauge Si/k" joist-55SJ Si Si Si Si Si Si Si	Similar Simi	Similar Simi	Similar Simi	Similar Signature Signat

	allowable	uniform load (1) (Ib/π)							
	lintel con	nponent section	designation by	size, style & ga	uge					
lintel span	8" joist-8	30SJ		91/4" joist-	-925SJ	9½" joist-	-95SJ	11½" jois	1-115SJ	131/2" joist
(ft)	18	16	14	16	14	16	14	16	14	135SJ14
4	1163	2283	3663	1968	3849	1915	3745	1576	3081	2616
6	775	1244	1628	1312	1949	1277	2014	1051	2054	1744
8	507	700	916	827	1096	851	1133	788	1423	1308
10	325	448	586	529	702	545	725	631	911	1047

378

278

365

378

238

307

193

fastener allowable loads (1)

225

151

table 13

487

342

367

270

		2 pan hd. 2 low-pro	8-18 & file hd. 8	-18	3/4" S-4 wash.h	hex nd. ¹ /4-14	4			
thickness (2)	pullout	(1)	shear (1)	pullout	(1)	shear (1)		
gauge	2.5 f.s.	3.0 f.s.	2.5 f.s.	3.0 f.s.	2.5 f.s.	3.0 f.s.	2.5 f.s.	3.0 f.s.		
22	58	48	168	140	95	79	247	206		
20	76	63	192	160	125	104	318	265		
18	112	93	264	220	182	152	478	398		
16	167	139	352	293	233	194	734	612		
14	216	180	412	343	305	254	929	774		

⁽¹⁾ Load in lb./fastener with factor of safety of 2.5, or 3.0 as required (2) For the thinnest metal in the attachment.

runner attachment spacing

table 14

	capacity bearing	using power y of 193-lb. s force. unner atta	single shea	r and 200-lb). 	capacity bearing	of 300-lb. s force.	single shea	r and 300-lb		capacity bearing	of 400-lb. force.	ver-driven fa single shear chment sp	r and 400-li	b.
	24	20	16	12	8	24	20	16	12	8	24	20	16	12	8
wind load (psf)	limiting	g heights (1)			limiting	heights (1)			limiting	heights (1)		
15	11'3"	13'4"	16'6"	23'4"	35'4"	16′1″	19'2"	23'8"	33'7"	50'4"	22'5"	26'8"	32'11"	46'8"	70′0″
20	8'6"	10'0"	12'9"	16'6"	25'6"	12'3"	14'4"	18'4"	23'8"	36'8"	16'11"	20'0"	25'5"	32'11"	50′11″
25	6'8"	8'0"	10'0"	13'4"	20'0"	9'7"	11'6"	14'5"	19'2"	28'9"	13'4"	16'0"	20'0"	26'8"	40'0"
30		6'8"	8'6"	11'3"	16'6"	8'1"	9'7"	12'3"	16'1"	23'8"	11'2"	13'4"	17′0″	22'5"	32′11″
35			7'2"	9'8"	14'9"	6'11"	8′5″	10'4"	13′10″	21'3"	9'8"	11'8"	14'4"	19'4"	29'6"
40			6'4"	8'6"	12'9"	6'0"	7'2"	9'2"	12'3"	18'4"	8'4"	10'0"	12'9"	16'11"	25'5"

⁽¹⁾ Select runner attachment spacing for limiting height obtained from axial combined load or curtain wall tables.

joist end clip

allowable loads (1)

table 15

clip length (in)	no. of screws (each leg)	allowable load (lb/clip)
6	3	560
8	4	890
10	5	980

⁽¹⁾ Standard 2"x2" 14 ga. galvanized steel clip angle for USG Light Steel Framing, attached with $\frac{1}{2}$ " USG Type S-12 Screws of quantity shown.



⁽¹⁾ Load values for lintels made of two boxed joist sections shown and with stiffened end condition. Max. total load deflection limited to L/360. Header sections must be checked for web crippling under concentrated loads.

USG Steel Framing Systems SA-510

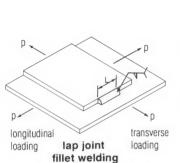
allowable shear strength for welds (lb./in.) (1)

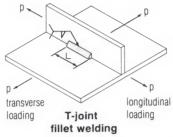
table 16

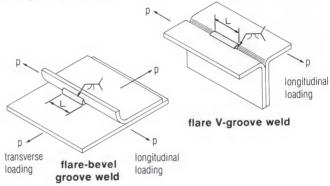
	design	fillet		flare/bevel-gro	ove	flare/V-groove	
steel gauge	thickness (in)	long.	trans.	long.	trans.	long.	
20 18 16 14	0.0359 0.0478 0.0598 0.0747	490 680 900 1160	650 860 1080 1350	490 650 810 1010	540 720 900 1120	490 650 810 1010	

(1) Loads were developed according to 1980 AISI Design Specifications and may be increased by 1/3 for wind or seismic loading. When joining different gauge members,

use load shown for lighter gauge. All welding to be done according to current American Welding Society practices.





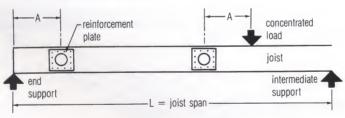


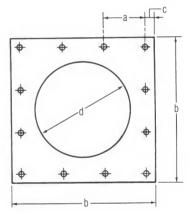
max. pipe opening and web reinforcement

table 17

joist size	"d" max. hole dia. (in)	"b" plate size (in)	"a" hole spacing (in)	"c" end dist. (in)	"A" min. distance to concentrated load or support (1'-0" min.)
115SJ	67/s	9	25/8	9/16	L/6
95SJ & 925SJ	51/8	9	23/8	15/16	L/25
80SJ	41/4	7	1 7/8	11/16	L/16
75SJ &725SJ	41/4	7	1 7/8	11/16	L/16
60SJ & 55SJ	31/2	51/4	1 7/16	15/32	L/10

Note: Plate thickness 14 ga. 3/16" pilot holes are for 1/2" Type S-12 Pan Head Screws.





max. web crippling loads (lb), USG Joist Web Stiffener

table 18

joist style & gauge	max. allowable loads*	
SJ14	9000	
SJ16	8500	
SJ18, 20, 22	7000	

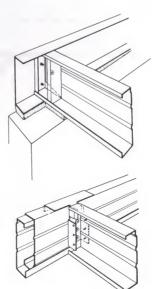
*Assuming 31/2" min. bearing

joist hanger allowable loads (1)

table 19

joist section designation— size, style & gauge	hanger (in)	no. of attachment screws req'd (2)	allowable load (lb. ea. hanger)
115SJ14	91/4	4	1170
95SJ16 &14	91/4	4	1170
925SJ16 & 14	91/4	4	1170
80SJ16 & 14	71/4	3	880
80SJ18	71/4	3	660
75SJ16 & 14	71/4	3	880
75SJ18	71/4	3	660
725SJ16 & 14	71/4	3	880
725SJ18	71/4	3	660

(1) Factor of safety=3.0. (2) 1/2" Type S-12 Pan Head.



maximum web crippling loads (1) (lb.), single joist unstiffened web

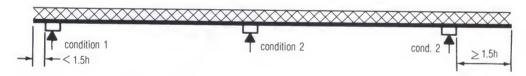
table 20

joist size, style & gauge	inside depth "h" (in)	condi	tion 1			condit	ion 2			condi	tion 3			condit	ion 4		
		bearing length															
		11/4"	31/2"	4"	6"	11/4"	31/2"	4"	6"	11/4"	31/2"	4"	6"	11/4"	31/2"	4"	6"
135SJ14	13.272	850	1069	1118	1312	1560	1854	1919	2281	543	683	714	839	1299	1349	1360	1404
115SJ14	11.272	912	1147	1200	1409	1636	1944	2013	2392	602	757	791	929	1511	1569	1581	1633
115SJ16	11.301	520	681	717	861	985	1212	1277	1593	327	429	452	542	764	801	809	841
95SJ14	9.272	974	1226	1282	1505	1712	2035	2106	2503	660	830	868	1020	1723	1789	1803	1862
95SJ16	9.301	569	746	785	943	1047	1287	1356	1692	373	489	515	619	931	976	986	
925SJ14	9.022	982	1236	1292	1517	1721	2046	2118	2517	667	840	878	1031	1749	1816	1831	1891
925SJ16	9.051	575	754	794	953	1054	1296	1366	1705	379	497	523	628	952	998	1008	
30SJ14	7.772	1021	1285	1343	1577	1769	2102	2177	2586	704	886	926	1088	1881	1954	1970	2034
30SJ16	7.801	606	794	836	1004	1092	1343	1416	1767	408	535	563	676	1057	1107	1118	1163
30SJ18	7.825	347	477	506	621	664	872	937	1195	226	310	329	404	559	592	599	629
75SJ14	7.272	1037	1304	1364	1601	1788	2125	2200	2614	719	904	945	1110	1934	2009	2025	2091
75SJ16	7.301	618	810	853	1024	1108	1362	1436	1791	420	550	579	695	1099	1151	1163	1209
75SJ18	7.325	357	490	519	638	676	889	954	1217	235	322	342	420	592	627	634	665
25SJ14	7.022	1044	1314	1374	1613	1797	2136	2212	2628	726	913	955	1122	1961	2036	2053	2120
25SJ16	7.051	624	818	862	1034	1115	1372	1446	1804	425	558	587	705	1120	1173	1185	1232
25SJ18	7.075	362	496	526	646	682	897	963	1228	239	328	348	428	608	644	652	684
60SJ14	5.772	1083	1363	1425	1674	1845	2193	2270	2697	763	959	1003	1178	2093	2174	2191	2263
60SJ16	5.801	655	859	904	1085	1154	1419	1495	1866	454	595	627	753	1224	1282	1295	1347
60SJ18	5.825	386	529	561	689	713	937	1007	1284	262	359	381	468	690	731	740	776
60SJ20	5.849	186	272	291	368	378	553	600	786	121	177	190	239	307	331	336	357
55SJ14	5.272	1099	1383	1446	1698	1863	2215	2293	2725	777	978	1022	1201	2146	2229	2247	2320
55SJ16	5.301	667	875	921	1106	1169	1438	1515	1890	466	611	643	772	1266	1326	1340	1393
55SJ18	5.325	395	543	575	706	725	953	1024	1306	271	372	394	484	723	766	775	813
55SJ20	5.349	193	282	302	382	387	567	615	805	127	186	200	252	331	356	362	385

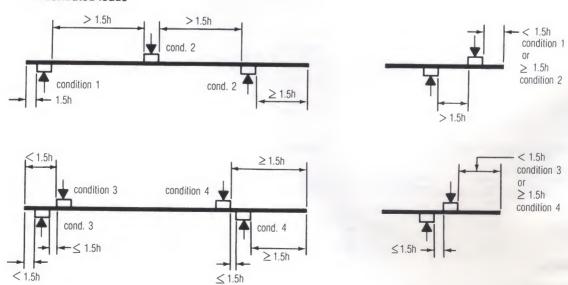
(1) Loads for conditions shown in details are for web crippling only and apply to joists with solid web at reaction points. See Sec 3.5.2 of AISI Specifications for calculating max. allow. combined bending and web crippling loads.

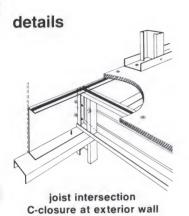
allowable reactions and concentrated loads (web crippling) sec. 3.5.1 of 1980 AISI specifications

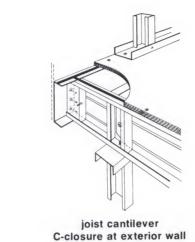
uniform load

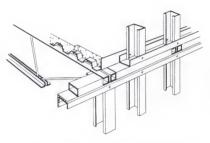


concentrated loads

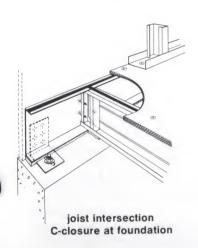


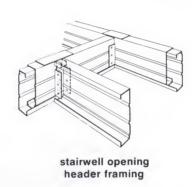


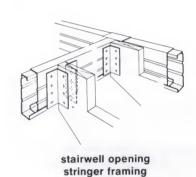


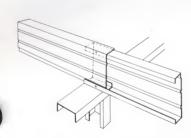


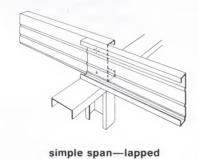
exterior wall framing—bar joists studs on framing



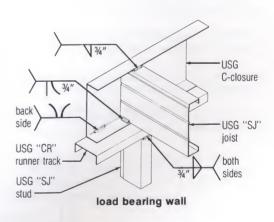








interior wall



simple span-nested interior wall



stud gauge (2) %" S-12 low profile head screws %" S-12 low

1" x 11/2" end stiffener to match USG "SJ" stud USG "CR" runner track both profile head screw each side

flare V-groove weld multiple stud attachment

USG "SJ"

stud

offset

stud/track weld attachment alternate for fixtured fabrication (panelization)

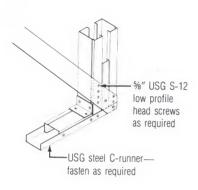
stud end stiffener at web cutout

stud/track attachment fillet weld

details

steel gusset plate as req'd.

USG steel studs as required —



-USG C-runner

- USG C-runner

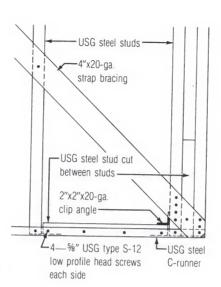
USG steel stud

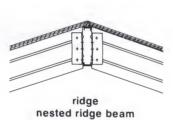
narrow opening framing

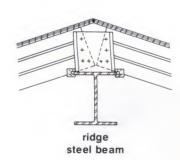
diagonal bracing

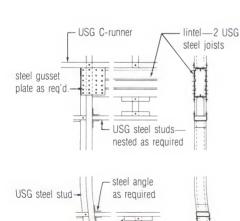
lintel-2 USG

steel joists



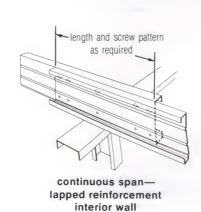


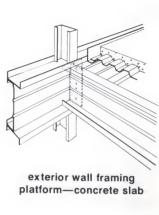


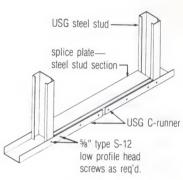


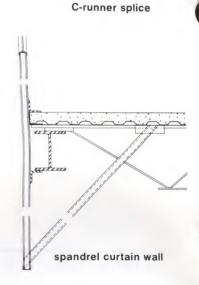
USG C-runner

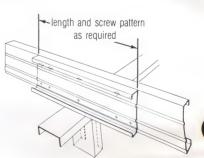
wide opening framing











continuous span joist reinforcement interior wall

good design practices

- 1. Technical Assistance—The data contained in this folder cover basic framing of load-bearing walls and floor/ceilings, with USG Steel Framing Systems. They are presented as a general guide to the architect or structural engineer in preparing project specifications. These products must not be used without prior structural design by a qualified engineer or architect. Technical assistance and consultation are right at hand from experienced technical sales representatives. These knowledgeable professionals with a valuable knack for solving tough problems are set to go when you are. Working from your drawings, job framing requirements can be computerized for maximum economy in quantities, sizes and weights of framing members. Your costs will be minimized with savings to you. For further information, help in planning and selecting the most efficient and economical framing member and other technical assistance contact Construction Steel Departments: Atlanta, GA (404) 393-0770; Kearny, NJ (201) 997-1600; Chicago, IL (312) 321-3979; Torrance, CA (213) 775-3696; Mansfield, TX (817) 477-5249.
- 2. System Performance—All details, specifications and data contained in this literature are intended as a general guide for using USG Steel Framing. Data are based on AlSI publication "Specification for the Design of Cold Formed Steel Structural Members", 1980 edition. These products must not be used in a design or construction of any given structure without complete and detailed evaluation by a qualified structural engineer or architect to verify suitability of a particular product for use in the structure. Information in this publication (or data sheet) should be used only for USG Steel Framing, as physical properties of competitive products may vary. United States Gypsum Company assumes no liability for failure of USG Steel Framing resulting from the use or misapplication of USG drawings, specifications or computations, or for failure resulting from improper installation of USG Steel Framing Systems.

Information from this publication should be used only in conjunction with USG Steel Framing Systems, as physical properties among competitive products may vary. The technical data contained in this catalog are based on AISI "Specification for the Design of Cold-Formed Steel Structural Members," 1980 Edition (except Sec. 5.1). United States Gypsum Company assumes no liability for failure resulting from use of its drawings, specifications or computations, or for failure resulting from improper application or installation of the steel framing system.

Caution: Welding may produce fumes and gases hazardous to health. Breathing of these fumes and gases should be avoided, and adequate ventilation should be used (see ANSI Z49.1-1967, Safety in Welding and Cutting, published by the American Welding Society).

- 3. Lateral Bracing of stud flanges can be provided by properly screwapplied gypsum board or gypsum sheathing. If other types of sheathing materials are used, such as FOAMULAR insulation, wood fiber, etc., 11/2" cold rolled channel or steel strap bracing must be provided. The designer should also consider whether accidental or intentional removal of sheathing during the life of the building warrants use of alternate bracing methods. Contact a U.S.G. Technical Sales Representative for bracing requirements, limiting heights, and allowable axial loads.
- 4. Diagonal Bracing shown in details is suitable for light racking loads similar to those found in single story buildings. To obtain assistance in developing bracing details and connections for heavier loading contact a U.S.G. Technical Sales Representative.
- 5. Note—United States Gypsum reserves the right to make improvements in, or change materials and/or configurations of, any products in this catalog, without prior notice and without obligation to incorporate the changes or improvements in items already manufactured. Certain framing items are non-standard and available only on special order.
- 6. Additional Information—See USG Steel Framing folders available from your local U.S.G. representatives: CS-54 Technical Manual

for technical information and structural/architectural details. For non-load bearing applications of these products, see U.S.G. technical folders in this series and in Sweet's General Building File: USG Exterior Curtain Walls folder SA-805, Sec. 8.14/Un in Sweet's; USG Steel-Framed Drywall Systems folder SA-923 for interior construction, Sec. 9.5/Ud in Sweet's. Also available separately, CASTLEGATE Insulated Steel Doors folder SA-815.

architectural specifications

Part 1: general

1.01 related work specified elsewhere

1.02 quality assurance

1.03 submittals

Part 2: products

2.01 materials

- **2.01.01** All studs and/or joists and accessories shall be of the type, size, gauge and spacing shown on the drawings and shall be manufactured by United States Gypsum Company.
- 2.01.02 All structural members shall be designed in accordance with American Iron and Steel Institute (AISI) "Specification For the Design of Cold Formed Steel Structural Members", 1980 edition.
- **2.01.03** All studs, runners and/or joists shall be formed from corrosion-resistant steel, corresponding to the requirements of ASTM A446, with a minimum yield strength of 40 ksi for members, 33 ksi for runners.

2.02 fabrication

- 2.02.01 Prior to fabrication of framing, the contractor shall submit fabrication and erection drawings to the architect or engineer to obtain approval.
- **2.02.02** Prefabricated panels shall be square, with components attached in a manner as to prevent racking and to minimize distortion while lifting.
- 2.02.03 All framing components shall be cut squarely for attachment in perpendicular members, or, as required, for an angular fit against abutting members.
- 2.02.04 Axially loaded studs shall be installed in a manner which will assure that their ends are positioned against the inside of runner web prior to fastening.
- 2.02.05 Insulation equal to that specified elsewhere shall be provided in all doubled jamb studs and doubled headers not accessible to insulation contractor.
- 2.02.06 Fastening of components shall be with self-drilling screws or welding. Screws or welds shall be of sufficient size to insure the strength of the connection. Wire tying of components shall not be permitted. All welds shall be touched up with a zinc-rich paint.

Part 3: execution

3.01 inspection

3.02 erection (wind load only)

- 3.02.01 Runners shall be securely anchored to the supporting structure as shown on the drawings.
- **3.02.02** Abutting lengths of runner shall each be securely anchored to a common structural element, butt-welded, or spliced.
- **3.02.03** Studs shall be plumbed, aligned and securely attached to flanges of both upper and lower runners.
- **3.02.04** Jack studs or cripples shall be installed below window sills, above window and door heads, and elsewhere to furnish supports, and shall be securely attached to connecting members.
- **3.02.05** Lateral bracing shall be provided by use of gypsum board and gypsum sheathing or by horizontal straps or cold-rolled channels.

3.02.07 Handling and lifting of prefabricated panels shall be done in a manner so as not to cause distortion in any member.

3.03 erection (axial load-bearing)

- 3.03.01 Runners shall be securely anchored to the supporting structure as shown on the drawings.
- 3.03.02 Complete, uniform and level bearing support shall be provided for the bottom runner.
- 3.03.03 Abutting lengths of runner shall each be securely anchored to a common structural element, butt-welded or spliced.
- 3.03.04 Studs shall be plumbed, aligned and securely attached to flanges of both upper and lower runners.
- 3.03:05 Framing of wall openings shall include headers and supporting studs as shown on the drawings.
- 3.03.06 Temporary bracing, where required, shall be provided until erection is completed.
- 3.03.07 Resistance to bending and rotation about the minor axis shall be provided by gypsum board and gypsum sheathing or by horizontal strap or cold-rolled channel bracing as shown on the drawings.
- 3.03.08 Diagonally braced stud walls, as indicated on the drawings, shall be provided at locations designated as "shear walls" for frame stability and lateral load resistance. Additional studs, when necessary, shall be positioned as indicated on drawings to resist the vertical components.
- 3.03.09 Splices in axially loaded studs shall not be permitted.

3.04 erection (joists)

3.04.01 Uniform and level joist bearing shall be provided at foundation walls by means of shims and/or non-settling grout.

- 3.04.02 Joists shall be located directly over bearing studs, or a load distribution member shall be provided at the top of the bearing wall.
- 3.04.03 Web stiffeners shall be provided at reaction points and/or at points of concentrated loads where indicated on the drawings.
- 3.04.04 Joist bridging shall be provided where indicated on the
- 3.04.05 Additional joists shall be provided under parallel partitions where the partition length exceeds one-half the joist span, also around all floor and roof openings which interrupt one or more spanning members, unless otherwise noted.
- 3.04.06 End blocking shall be provided where joist ends are not otherwise restrained from rotation.

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, SHEETROCK, FIRECODE, THERMAFIBER. FOAMULAR is a trademark of UC Industries.

Note: All products described here may not be available in all geographic markets. Consult your U.S.G. sales office or representative for information.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAM-AGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited or replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

U.S.G. Customer Order Centers: California: Glendale, (213) 956-1882; South Gate, (213) 588-1121; Torrance, (213) 775-3696 • Florida: Jacksonville, (904) 764-3296 • Georgia: Atlanta, (404) 393-0920 • Illinois: Chicago, (312) 321-4101; Franklin Park, (312) 455-8672 • Indiana: Shoals, (812) 247-2501 • Iowa: Ft. Dodge, (515) 576-7602 • Louisiana: New Orleans, (504) 246-3746 • Maryland: Baltimore, (301) 355-2200 • Massachusetts: Charlestown, (617) 241-8900 • New York: Oakfield (716) 948-5287; Stony Point, (914) 786-2793 • Ohio: Gypsum, (419) 732-2171 • Texas: Dallas, (214) 357-6271 • Virginia: Norfolk, (804) 543-3586.

description and utility

THERMAFIBER Insulation Products consist of spun mineral fibers formed into mats of varying dimensions and densities depending on use, or into pellet forms for pouring or blowing into framing spaces. They are available in various types of blankets, in loose fill, and as semi-rigid safing, curtain wall and column fireproofing insulation.

Compared to other insulation, THERMAFIBER Insulation has superior resistance to heat and sound transmission, resilience that assures full installed thickness, and outstanding durability. Its greater rigidity aids staying in place. In manufacturing it is quality-controlled from start to finish. Other features:

Noncombustible—the mineral fibers will not burn or support combustion. Products without facings are rated noncombustible as defined by NFPA and National Fire Code when tested per ASTM E136. Use of THERMAFIBER blankets increases fire ratings of certain partition assemblies. When subjected to ASTM E119 time temperature criteria, THERMAFIBER Insulation remains intact for over 5 hr. and is significantly superior to low-melt point glass fiber insulation in fire resistance. See separate folder in this series, SA-707, for details on THERMAFIBER Fire Safety Systems.

Vapor Resistance—three types of Thermafiber Blankets have built-in vapor retarders (formerly called barriers) to protect against condensation. Aluminum foil or strong, asphalted kraft paper have excellent vapor resistance factors of 0.30 and less than 1.00 respectively. Other types are highly effective when used with Foil-Back Sheetrack Brand Gypsum Panels, Foil/Back Imperial Gypsum Base or Foil-Back ROCKLATH Plaster Base.

Moisture Resistance—mineral fibers do not absorb moisture. If wet, they dry quickly with adequate ventilation and recover their original insulating efficiency.

Asbestos-Free—THERMAFIBER Insulation products contain no asbestos in any form.

Nondeteriorating—the mineral fibers offer no sustenance to vermin; are resistant to decay and corrosion.

Rigidity, Strength—THERMAFIBER blankets have exceptional built-in rigidity, especially important for ceiling work. Batts have triple-thick, extra-wide flanges which make installation quicker and more secure. Sound Control Value—THERMAFIBER blankets increase sound isolation and STC ratings when used in certain partition and floor/ceiling assemblies. Their acoustical absorption properties can be utilized to reduce noise levels and reverberation.

Ventilation—insulation of attics and crawl spaces should be accompanied by adequate ventilation. HUD/FHA recommendations of one sq. ft. free vent area per 150 sq. ft. of attic or basementless floor area should be followed to help reduce air-conditioning costs and control moisture condensation.

general limitations

- 1. Although the vapor retarders of THERMAFIBER Blankets protect against the formation of condensation and reduce the danger of damage caused by condensation, over-humidification must be guarded against. If the relative humidity in the building is excessive, steps must be taken to reduce the sources of moisture.
- 2. If THERMAFIBER Insulation is placed in direct contact with exterior walls, the masonry must be watertight. Positive vapor retarders such as foil-back gypsum boards of 6-mil polyethylene film should be applied to room side of furring members in order to reduce possibility of condensation on cold masonry walls.
- 3. Blankets placed between floor joists over unexcavated or basement areas should be supported by wire mesh, woven tie-wire or flexible metal rods.



Installing THERMAFIBER Blankets between steel studs

- **4.** Additional support is required for 5¼" and 6" thick blankets when joist spacing exceeds 16" o.c. and for blankets 3" or thicker installed between joists over suspended ceilings in high-humidity areas.
- 5. THERMAFIBER Blankets faced with foil or kraft vapor retarders which contain asphalt, should be treated as a flammable surface, never exposed to open flame.
- 6. To prevent objectionable sag in new gypsum board ceilings, the weight of overlaid unsupported insulation should not exceed 1.3 psf for $\frac{1}{2}$ " thick board with frame spacing 24" o.c.; 2.2 psf for $\frac{1}{2}$ " board on 16" o.c. framing and $\frac{5}{6}$ " board on 24" o.c. framing.

thermal insulating properties

In this era of fuel shortage, adequate insulation is an important part of the government's energy-conservation program. Proper insulation reduces heat transmission through walls, ceilings and floors to control interior temperatures for added comfort and fuel savings.

In accordance with industry standards, THERMAFIBER Insulation products are labeled to show each product's thermal resistance (of insulation only) and thickness. Resistance values per ASTM C177 are listed below for insulating blankets shown on pages 2 and 3.

product & thickness	therm. resist. (insul. only)	product & thickness	therm. resist (insul. only)
kraft-faced bla	nkets	foil vapor barri	ier side (1)
6"	22	6"	22
51/4"	19	51/4"	19
31/2"	13	31/2"	13
3"	11	3″	11
Z-furring blank	ets	sound attenua	tion blankets
3"	12.00	3"	12.00
2"	8.00	2"	7.41
11/2"	6.00	11/2"	5.77
1"	4.17	1"	4.00
M-S blankets		W-S blankets	
3"	11.54	31/2"	13.46
35/8"	13.94		

(1) For insulation with foil facing a plane air space (minimum $\frac{1}{2}$ "), the installed "R" is higher than for non-foil faced insulation of identical "R".

thermal resistance values* (R=1/C)

air

for use in calculating heat transmission coefficients (U)

25/32" insulating sheathing 2.06 ½" insulating sheathing 1.32 ½" gypsum sheathing 0.45 1" FOAMULAR Polystyrene Insulation (1) Insulation 5.00 ½" plywood 0.62	V2" gypsum panels 0.45 3%" plaster base 0.32 ½" sanded plaster 0.09 ½" plaster with It. wt. aggregate 0.32 portland cement with aggregate (per in.) 0.20
34" plywood	4" common brick
34" softwood (pine)0.94 34" hardwood0.68	8" clay tile1.85 8" concrete block with
1" x 8" wood drop siding0.79 3/4" x 10" beveled wood siding.1.05 exterior stucco (1" thick)0.20 3/8" built-up roofing0.33 wood shingle roofing0.94 asphalt shingle roofing0.44	sand aggregate

	(type of surface) non-reflective reflecti				
	non-reflective	reflective			
space values (2)					
heat flow up	0.75	1 57			

heat flow up 1/2" space	1.57 1.66 2.01	
heat flow down 1/2" space	2.54 3.52 8.17	
heat flow horizontal 1/2" space	2.46 2.77 2.55	
air surface values inside, heat flow up (still air)	1.32 4.55 — —	

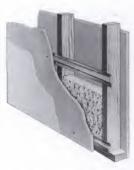
*Based on listings in ASHRAE Handbook of Fundamentals (1977). (1) Thermal resistance for FOAMULAR insulation at 40°F mean temperature is 5.4; data based on certified test. (2) Based on 50°F mean temperature and 30°F temperature differential.

section to be insulated	U-value insulation only	THERMAFIBER R-value needed for "U" shown			
ceilings	0.026	R-38			
0	0.033	R-30			
	0.045	R-22			
	0.053	R-19			
walls	0.053	R-19			
	0.077	R-13			
	0.091	R-11			
floors (over					
unheated space)	0.045	R-22			
	0.053	R-19			
	0.077	R-13			
	0.091	R-11			

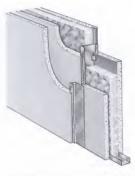
typical sound-barrier assemblies



steel stud—gypsum drywall STC 54 2-hr. (UL Des U412)



wood stud—veneer plaster STC 50 1-hr. (UL Des U311)



ULTRAWALL movable partition STC 50 2-hr. (UL Des U416)



floor/ceiling—resilient drywall STC 52, IIC 71 1-hr, (est. based on UL Des L514)

sound control properties

THERMAFIBER Insulation has excellent sound-absorbing properties in addition to providing thermal values. Sound-absorbing materials absorb energy from sound waves and convert it to heat. As energy is absorbed, there is a proportional reduction in sound transmitted.

Two types of THERMAFIBER Insulation Blankets are used for their acoustic properties:

THERMAFIBER Regular Blankets, enclosed in heavy paper, are used in wood-frame construction; THERMAFIBER Z-Furring Blankets and THERMAFIBER Sound Attenuation Blankets, paperless, semi-rigid and of greater density, are designated in fire-rated assemblies. THERMAFIBER Insulation in partition cavities improves STC ratings up to nine points.

Sound ratings are based on tested results of specific components and details of assembly, not on the ceiling or partition membrane alone (see Construction Selector for tested assemblies). The sound control of an assembly cannot be accurately predicted if insulation of unequal properties is substituted.



THERMAFIBER Regular Blanket



THERMAFIBER
Aluminum Foil-Faced Blanket

types and functions

insulating blankets

THERMAFIBER Regular Blankets are faced on one side with strong asphalted vapor retarder that extends to form nailing flanges, and are encased on the other sides with porous, kraft breather paper. These blankets also are supplied with flame-retardant breather paper. **Uses:** ceilings, floors, walls. Where installed from the cold side of framing, as in crawl spaces, blankets are held in place with chicken wire or tie wire stapled or nailed to joists or by using flexible metal rods. Available from Corsicana and Tacoma plants in 3" to 6" thicknesses and in widths to accommodate common structural spacings. Meet Federal Specs. HH-I-521F Type II and ASTM C665.

THERMAFIBER Aluminum Foil-Faced Blankets are similar to paper-enclosed Regular Blankets, but with highly reflective aluminum foil laminated to vapor retarder side. Blankets require a minimum air space next to the foil of ½" in sidewalls and 1" in ceilings to fully benefit from the foil reflectivity. Uses: ceilings, walls, floors with air space—most effective with air-conditioning and in areas of extreme summer temperatures. Available from Tacoma plant in 3", 3½", 5¼" and 6" thickness, 15" and 23" widths. Meet Federal Specs. HH-I-521F Type III and ASTM C665.

THERMAFIBER Flame-Resistant Blankets are open-faced, foil-covered on vapor retarder side. The foil-kraft laminate is applied with a special flame-resistant adhesive. Blankets require a minimum air space same as Foil-Faced Blankets for improved installed thermal resistance. **Uses:** ceilings, floors, walls for flame-resistant insulation and vapor control or where insulation will be exposed. Available from Birmingham, Corsicana and Wabash plants in 3", 31/2", 51/4" and 6" thickness, 16" and 24" widths for steel framing, 48" length. With foil attached, UL surface burning characteristics per ASTM E84: flame spread 10-25, fuel contributed 5, smoke developed 0. Meet ASTM C665 and Fed. Specs. HH-I-521F, Type III except identification marking paragraph 3.7.1.

THERMAFIBER W-S Blankets are paperless, thus eliminate need for staple fastening; made slightly wider than normal to give friction fit between wood studs. Uses: for sidewalls only. Used with FOAMULAR extruded polystyrene foam insulating sheathing in 1-hr. fire-rated wood-frame exterior wall. W-S Blankets require a separate vapor retarder, such as Foil-Back SHEETROCK Brand Gypsum Panels, ROCKLATH Plaster Base or IMPERIAL Gypsum Base, or a 6-mil polyethylene film. Available from all plants in 3½" thickness, 15" and 23" widths. Meet ASTM C665 and Federal Specs. HH-I-521F, Type I except identification marking paragraph 3.7.1.

THERMAFIBER M-S Blankets are specially designed for insulating exterior furring and wall assemblies which utilize steel studs. They are open-faced and required same types of separate vapor retarder as W-S Blankets. Staple-attached to gypsum sheathing or held in place against metal lath with horizontal tie-wires. Available from all plants in 3" and 3%" thicknesses, 16" and 24" widths, 48" length. UL surface burning characteristics per ASTM E84: flame spread 15, fuel contributed 0, smoke developed 0. Meet ASTM C665 and Federal Specs. HH-I-521F, Type I except identification marking paragraph 3.7.1.

THERMAFIBER Z-Furring Blankets are designed for use as an effective semi-rigid insulating material in exterior wall furring applications using

USG Z-Furring Channels. They require same types of separate vapor retarder as W-S Blankets. Blankets are a paperless, semi-rigid spun mineral fiber mat, 1", 1½", 2" and 3" thickness, 16" and 24" widths, 48" length, with densities of 6.0, 4.5, 4.0 and 4.0 pcf, and "k" factors of 0.24, 0.25, 0.25 and 0.25 respectively. Surface burning characteristics per ASTM E84: flame spread 15, fuel contributed 0, smoke developed 0. Meet Federal Specs. HH-I-521F Type I except identification marking paragraph 3.7.1.

THERMAFIBER Curtain Wall Insulation, a semi-rigid material, is suitable for use with steel studs in USG Curtain Wall Systems. See SA-707 Fire Safety Systems Folder for detailed information. **THERMAFIBER Safing Insulation** is an efficient fire-stop at spandrel panel/floor intersections when combined with Curtain Wall Insulation. See SA-707 Fire Safety Systems Folder for detailed information.

THERMAFIBER Blowing Wool is granular mineral fiber insulation for application by pneumatic machine. Used for insulating ceiling areas in new or existing buildings and exterior walls in remodeling (see Technical Data Sheet IW-562 for product specifications).

sound attenuation blankets

THERMAFIBER Sound Attenuation Blankets are a paperless, semirigid spun mineral fiber mat which substantially improves STC ratings when used in stud cavities of U.S.G. partition assemblies. Each blanket has a dense, highly complex labyrinthine structure composed of fibers that form millions of sound-retarding air pockets. Available in 1", 1½", 2" and 3" thickness with 4.0, 3.0, 2.5 and 4.0 pcf density respectively, 16" and 24" width, 48" length. Surface burning characteristics per ASTM E84: flame spread 15, fuel contributed 0, smoke developed 0. Meet Fed. Specs. HH-I-521F Type I.

THERMAFIBER Sound Attenuation Blankets are used in various partition systems listed below (for details see Construction Selector—in Sweet's Sec. 9.5).

Drywall Partitions	STC Rating
Steel Stud—Double Layer Gypsum Panels	53 to 55
Steel Stud—Single Layer Gypsum Panels	45 to 48
Wood Stud—Double Layer Gypsum Panels	53 to 59
Wood Stud—Single Layer Gypsum Panels	45 to 54
Movable	46 to 50
Area Separation Wall	47 to 57
Cavity Shaft Wall	47 to 51
Drywall Ceilings	
Steel Bar Joist—Single Layer Gypsum Panels	54
Wood Joist—Single Layer Gypsum Panels	41
Wood Joist—Resilient Gypsum Panels	52
Veneer Plaster Partitions	
Steel Stud-Double Layer Gypsum Base	49 to 53
Steel Stud—Single Layer Gypsum Base	45
Wood Stud—Resilient Gypsum Base	49 to 53
Standard Plaster Partitions	
TRUSSTEEL Stud—Resilient Gypsum Lath	52
Steel Stud—Gypsum Lath	49



THEHMAFIBER Flame-Resistant Blanket



THERMAFIBER M-S Blanket



THERMAFIBER Z-Furring Blanket



THERMAFIBER
Sound Attenuation Blanket

specifications

notes to architect

- 1. Sound-Rated Systems-see U.S.G. Construction Selector for STC ratings of partition and floor/ceiling assemblies with THERMAFIBER Insulation.
- 2. Vapor Retarders-In areas where high humidity and temperature predominate, consideration should be given to placing the vapor retarder on warm or outside of wall to prevent moisture condensation within the insulation.
- 3. Ceilings-Insulation should be carefully fitted around recessed lighting fixtures. Covering fixtures with insulation causes heat to build-up which could possibly result in fire.

Part 1: general

1.1 scope-Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

Part 2: products

2.1 materials

- 2.1.1 Insulating Blankets: THERMAFIBER (Regular) (Open-Faced) (Foil-Faced) (Flame-Resistant) (W-S) (M-S) (Z-Furring) blankets, () thick, () wide, () long.
- 2.1.2 Sound Attenuation Blankets: THERMAFIBER Sound Attenuation Blankets, () thick, () wide, 48" long, () pcf density.

Part 3: execution

3.1 insulating blanket application

Install THERMAFIBER Insulation in framing spaces, including areas between floor joists and outside headers, leaving no voids. Install behind electrical outlets, around structural obstructions, jambs, sills, etc. Cover all such areas as well as plates and headers with vapor

a. Insert flanged blankets between framing members, vapor retarder facing inward and recessed (1/2") (3/4") (1") from face of framing, flanges stapled to sides of framing members at each end of blankets and along length of flanges. Staple flanges 6" o.c. max. on walls and ceilings, 4" o.c. max. on floors. Use 9/16" staples in a trigger or power stapler.

If required by local code, flanges on vapor retarder sides of blankets may be stapled to faces of framing members providing abutting flanges do not overlap and are stapled flat, without bulges or folds that will prevent tight attachment of interior surfacing materials.

- b. Install W-S Blankets between studs from interior side of wall, recessed slightly from stud faces. Do not staple—friction fit holds blankets in place. Provide separate vapor retarder with installation of: Foil-Back (SHEETROCK Brand Gypsum Panels) (ROCKLATH Plaster Base) (IMPERIAL Gypsum Base) (6-mil polyethylene film).
- c. Install M-S Blankets between studs from interior side of wall. Attach blankets to gypsum sheathing using 9/16" staples with divergent points placed at each corner and in center of each blanket. Hold blankets tightly against metal lath backing with taut horizontal tie-wires spaced max. 36" o.c. Provide separate vapor retarder same as for W-S Blan-

3.2 furring blanket application

Position Z-Furring Blanket vertically against wall surface. Hold in place with a USG Z-Furring Channel according to U.S.G. directions. Position next blanket so that it abuts attached furring member and hold in place with next furring channel.

3.3 sound blanket application

Install THERMAFIBER Sound Attenuation Blankets in stud cavities of sound-rated partitions. Friction fit securely between studs. Butt ends of blankets closely together and fill all voids.

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Note: All products descibed here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

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U.S.G. Mineral Fiber Div. Sales Offices: Alabama: Birmingham, (205)849-0274 • Indiana: Wabash, (219)563-2111 • Texas: Corsicana, (214)874-4781 • Washington: Tacoma (206)627-0379.

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system folder

FOAMULAR® Extruded Polystyrene Insulation meets energy-savings requirements for today's buildings

versatile application

- commercial/industrial/residential-even earth-shelterconstruction
- cavity-wall, furred-masonry wall, wood- and steelframing sheathing, foundation wall/slab perimeter, retrofit, single-ply membrane flat roof/re-roof
- six thicknesses up to 3 in and compatible sizes
- · rigid-board for easy handling
- extruded for excellent thermal/water resistance
- U.S.G.-system-tested with 1-hr exterior wall ratings available
- · meets codes and standards

long term performance

- high R-factor, even when wet
- closed-cell for low water absorption
- · high strength and rigidity, low weight



FOAMULAR® Polystyrene Insulation provides exceptionally low thermal conductivity and high water resistance properties. These excellent properties are incorporated in buildings systems developed by United States Gypsum for energy savings in new buildings and old.

Performance-tested assemblies combine FOAMULAR Insulation with conventional materials in 1-hr fire-rated, load-bearing walls with steel- or wood-stud framing. FOAMULAR Panels economically insulate masonry cavity walls, foundations and slab perimeters, plus flat, single-ply membrane roofs or re-roofs; and, with USG Z-Furring Channels, exterior masonry and concrete walls.

FOAMULAR Polystyrene Insulation is extruded plastic foam. Closed-cell structure and continuous skin surfaces combine to provide high strength, rigidity and water-resistance for reliable, long-lasting performance—even below grade (see Product Data).

FOAMULAR Insulation complies with Federal Specification HH-I-524C, Type IV; and is accepted by code authorities under Research Reports: BOCAI 82-36, ICBO 3628, SBCCI 8189. It is classified as Foamed Plastic by Underwriters Laboratories Inc. (see Classification Certificate U-197).

performance & application

These efficient systems minimize heat transmission for greater occupant comfort, along with lower fuel and heating equipment costs. Featured performance includes:

One-hour fire rating—with either wood framing (test no. WHI-495-0379), or USG Steel Framing (test no. CEG 11-9-79).

Insulating effectiveness—thermal resistance (R) of 5.4 at 40°F, and 5.0 at 75°F, mean temperature for 1-in thickness—higher than other commonly used insulating products; thermal break to insulate exterior framing when applied as sheathing; tight-fitting tongue and groove edges to effectively reduce air infiltration and permit joints between framing members.

Water resistance—excellent resistance to water absorption, water vapor transmission and low capillarity to maintain effective R-factor even when used below grade or outside foundation, good hydrophobic properties to minimize wicking and provide superior dimensional stability under high humidity conditions.

Long term durability—high strength and built-in rigidity resist damage in backfilling, permit use under slabs; panels are resistant to decay, mildew, fungus, corrosion and common soil acids

Economical handling/installation—rigid-board form, light weight and variety of size permit easy handling, even in wind; quick score-and-snap fitting, conventional tools and techniques plus special USG Wafer-Head Screw attachment make one-man installation a reality.

The closed-cell core structure of FOAMULAR Polystyrene Insulation is revealed in this electronmicroscope cross-section enlargement. Tightly packed cells produce high resistance to water and heat transmission. Continuous cell walls with lack of cell voids contribute to high strengths, minimize wicking and water absorption.

limitations

1. Application temperature range—FOAMULAR Insulation is not recommended where sustained temperatures exceed 165°F. Do not use it in contact with chimneys, heater vents, steam pipes or surfaces with temperatures over 150°F.

2. Vapor protection—Vapor retarders of .08 perm (or better) rating are recommended for maximum protection. This category includes: Foil-Back SHEETROCK Brand Gypsum Panels, Foil-Back IMPERIAL Gypsum Base and 4-mil polyethylene film. In moderate climates, use 2-mil polyethylene film, asphalt-coated kraft paper or prime coats of vapor-retarder-type paint. For exterior walls enclosing high-moisture areas—bathrooms, kitchens, laundry rooms, etc.—apply .08-perm rated vapor retarder to interior face of wall panels, and provide mechanical ventilation to remove excess moisture. 3. Interior protection—Wherever people will be present, mechanically fasten 1/2" SHEETROCK Brand Gypsum Panels, IMPERIAL Gypsum Base or equivalent to interior side of building framing to completely cover FOAMULAR Insulation. This requirement applies as well to garages, plenums, attic spaces, basements and crawl spaces (see "good design practices").

4. Exterior finish systems/protection of insulation—Protect FOAMULAR Insulation used as sheathing insulation with masonry veneer, exterior siding or other exterior finishes, and mechanically attach it through insulation/sheathing into framing.

5. Frame member spacing—Maximum stud spacing 24" o.c., except 16" o.c. for fire-rated wood-stud assemblies.

6. Structural bracing—FOAMULAR Insulation is not a structural material; adequate diagonal/lateral bracing for structural framing is required in accordance with manufacturer's current printed instructions and all applicable building codes.

product technical information

FOAMULAR Polystyrene Insulation is polystyrene foam extruded into panels by a patented vacuum/hydrostatic process which develops continuous skin surface and closed-cell core. Cells have interconnecting walls of consistent thickness and with no voids. This uniform structure gives FOAMULAR Insulation high thermal resistance and superior water-resistance.

Moisture significantly reduces thermal effectiveness of many insulation materials. It particularly affects loose fill and fibrous batts, and urethane and molded polystyrene (beadboard) panels to a lesser extent. FOAMULAR Insulation absorbs less water and transmits less water vapor than either molded polystyrene or urethane, thanks to the surface skin and closed-cell structure that extruding provides. Closed-cell structure also accounts for its higher thermal efficiency (greater "R" per inch thickness) than that of molded polystyrene, fibrous or loose-fill insulation.

product data

Material: Extruded polystyrene closed-cell foam panel with continuous skins on face and back surfaces.

Weight: Approx. 150 lb/1000 ft², per inch thickness.

Packaging: Bundles wrapped with two stretch-bands.

steel-frame sheathing



masonry cavity wall insulation



wood-frame sheathing



Z-furring insulation



sizes

	thickness							
width x length	3/4"	1"	11/2"	2"	21/2"	3′		
square edge (SE)								
16" x 8'		×	X	×		X		
24" x 8'	×	×	X	×	X	X		
48" x 8'	×	X	Х					
tongue & groove edge (T/G)								
24" x 8' or 9' (1)	×	X	X	×				
48" x 8' or 9' (2)	×	X	X					

(1) T/G on four edges. (2) T/G long edges. Other sizes available on request.

typical physical properties—1-in. thickness (1)

property	ASTM test reference	value
density—lb./ft. ³	C303	1.8
compressive strength—lb./in.2	D1621	20.0(2)
flexural strength—Ib./in.2	C203	75.0(3)
dimensional stability—% linear change	D2126	2.0
thermal conductivity—"k" —Btu x in/tt.²xhr.x°F. 40 °F mean temperature 75 °F mean temperature thermal resistance—"R"	C518	0.18 0.20
at 40 °F — hr./°F/Btu at 75 °F		5.4 5.0
water absorption—% by vol.	C272	0.1
water vapor transmission— perm-inch	C355	0.7
flame spread	E84	5(4)
smoke developed	E84	35 (4)
capillarity	_	none

(1) Values shown are representative of a 1-inch thickness of FOAMULAR Insulation. For property ranges or specification limits, consult your sales representative. (2) Value at 10% deformation. (3) Average of values from tests conducted in longitudinal and transverse directions (FOAMULAR Extruded Polystyrene Insulation is anisotropic). (4) This rating is not intended to reflect the hazard presented by this material under actual fire conditions.

Steel-stud framed exterior walls

versatile design concept

- economical envelope insulates studs, creates thermal break around structure
- · choice of conventional finishes, interior and exterior
- 1-hr fire rating available (test no. CEG 11-9-79)

Exterior wall assemblies described here combine the thermal advantages of FOAMULAR Insulation with the structural/economic advantages of noncombustible steel stud construction. They offer exceptional versatility with a choice of conventional exterior and interior finishes. One, test no. CEG 11-9-79, sheathed with 1-in FOAMULAR Insulation and ½-in gypsum sheathing, offers a 1-hr fire rating for many types of structures, including office buildings, schools, shopping centers, motels and low-rise apartments.

fire-tested performance

- load-bearing, drywall construction
- · economical components
- suitable for light commercial or residential buildings

The 1-hr fire-rated, load-bearing system consisted of: 1-in thick FOAMULAR Insulation, 24-in wide with T&G edges, screw-applied over ½-in USG Gypsum Sheathing to 3½-in USG Steel Framing studs; ½-in cedar plywood siding as an exterior facing; 3%-in THERMAFIBER M-S Mineral Fiber Blankets installed in the stud cavities. The interior was finished with 5%-in SHEETROCK Brand FIRECODE "C" Panels installed vertically and screw-attached to studs. Interior panel joints and fasteners received conventional joint treatment. See U.S.G. Technical Folder SA-510, 1983 version, for additional fire tests with full allowable axial compressive loads on USG Steel Framing.

specialized screw attachment

- positive attachment
- automatic stop with ring thread
- avoids compression of insulation
- 4 lengths to accommodate all thicknesses
- penetrates steel through 14-ga

The USG Wafer Head Insulation Screw simplifies attachment of FOAMULAR Insulation to steel studs in these systems. It is self-drilling, self-tapping, and its large (7/16-in diam.) head provides greater bearing for positive insulation attachment. A special ring thread provides an automatic stop at just the right



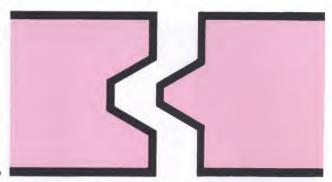
The special USG Wafer Head Insulation Screw assures quick, secure attachment of FOAMULAR Insulation to steel studs.

penetration. The Phillips-head recess permits fast installation with a conventional screwgun. Screws are highly corrosion-resistant, available in lengths of 1½, 2, 2½ and 3-in; Types R and S-12 for steel thickness ranges equal to 25-22 ga and 20-14 ga, respectively.



2" USG Wafer Head Insulation Screw

tongue-and-groove edge



The four pyramid-shape tongue-and-groove edges on 24-in wide panels are strong and fit tightly to reduce air infiltration and resist accidental damage. Also important, they permit end joints to occur between studs, simplifying installation with staggered end joints.

thermal resistances (R) (1) for typical steel stud assembly(2)

1-hr rated assembly

- a. Exterior Facing b. Air Space-1", for
- face brick only c. FOAMULAR Insulation
- d. ½" USG Gypsum Sheathing e. Blankets in cavities—3½" THERMAFIBER Insulation
- f. Studs—steel, 3½" deep g. Interior Finish—%" SHEETROCK Brand FIRECODE "C" Gypsum Panels

	wall component selection							
FOAMULAR Insulation		exterior facing component "a"						
thickness/ R-factor(1) (hr./°F/Btu)	steel stud spacing	1" stucco	½" plywood (Doug. fir)	4" face brick				
3/4"	16"	13.42	13.99	15.06				
(R-4.06)	24"	14.49	15.06	16.10				
1"	16"	15.17	15.72	16.75				
(R-5.41)	24"	16.23	16.75	17.76				
11/2"	16"	18.48	18.94	19.92				
(R-8.12)	24"	19.46	19.92	20.88				
2"	16"	21.55	22.03	22.88				
(R-10.82)	24"	22.52	22.94	23.87				

(1) Resistances are calculated, including inside/outside air films, with framing adjustments of 20% for stud spacing at 16" o.c., 15% at 24" o.c., based upon procedures and design values for all components at 75°F mean temperature from 1981 ASHRAE Handbook of Fundamentals except values: from UC Industries at 40°F for FOAMULAR insulation, from United States Gypsum Company at 75°F for all other branded components listed above left. (2) Assembly has been fire-rated for one hour.

Wood-stud framed exterior walls

high energy efficiency

- R-19 walls with 2x4 studs
- thermal-break insulating envelope around framing
- optimum energy design when foundation also insulated

Used as an insulating sheathing, FOAMULAR Extruded Polystyrene Insulation can provide 2x4 wood-stud exterior brick veneer wall assemblies with economical R-19 ratings for residential/light commercial building types, especially apartments and condominiums. In addition, a 1-hr fire-rated system is available for wood-framed buildings. Other materials and techniques in these high-performance exterior wall systems are conventional. As sheathing, this insulation creates a thermal break outside the studs, an energy-conserving barrier around the building that insulates the entire frame. When insulated around the foundation also, the building is protected from excessive heat loss to the ground as well as the air (see p. 8).

versatile application

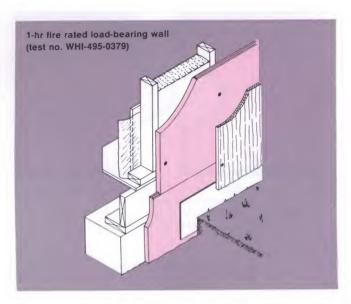
- choice of exterior finishes, convenient drywall interior
- · nail or staple application
- 1-hr fire rating available (test no. WHI-495-0379)

Many types of exterior finishes can be used over FOAMULAR Insulation used as sheathing, including: masonry veneer; wood, aluminum, steel or vinyl sidings; wood or mineral shingles; or reinforced stucco. In addition to FOAMULAR Insulation outside the studs, 31/2-in THERMAFIBER W-S Mineral Fiber Blanket Insulation is installed in stud cavities for maximum thermal resistance. Wall interior is completed with 1/2-in SHEETROCK Brand Gypsum Panels. For walls with a fire rating requirement, a very similar 1-hr assembly is available, as described below.

fire-tested performance

- 2x4 wood studs, 16 in. o.c.
- 1-in thick FOAMULAR Insulation as sheathing
- 1/2-in thick cedar plywood exterior siding
- 3½-in THERMAFIBER W-S Mineral Fiber Blankets in stud cavities
- %-in SHEETROCK Brand FIRECODE Gypsum Panel interior

This 1-hr rated assembly is shown cut-away on following page. It passed ASTM E119 fire exposure and hose stream tests. FOAMULAR Insulation is 24-in wide with T&G edges and nailed to studs. Interior drywall is installed vertically with 6d nails 7 in o.c. and conventional joint treatment.



thermal resistances (R) for typical wood frame walls

exterior finish	cavity insulating blanket thickness (in.)		Thermal Resistance (R) of Wall (1) (for winter conditions, incorporating cavity and sheathing insulation:)					
		stud spacing (in.)	¾"(R-4.06)	FOAMULAR insula 1"(R-5.41)	tion sheathing (thickr 1½"(R-8.12)	ness/"R") 2″(R-10.82)		
1/2" douglas fir plywood siding (R62)	3½ (R-13)	16 24	16.31 16.86	17.70 18.32	20.58 21.14	23.36 23.92		
³ ⁄ ₄ " wood siding (R-1.05)	3½ (R-13)	16 24	16.75 17.33	18.15 18.73	21.01 21.60	23.81 24.33		
4" face brick (R44)	3½ (R-13)	16 24	17.06 17.67	18.55 19.12	21.37 21.93	24.15 24.75		
aluminum siding (R61)	3½ (R-13)	16 24	16.26 16.86	17.70 18.32	20.58 21.14	23.36 23.87		
vinyl siding (R71)	3½ (R-13)	16 24	16.39 16.98	17.83 18.38	20.66 21.28	25.25 25.97		
1" stucco (R20)	3½ (R-13)	16 24	15.82 16.42	17.27 17.86	20.12 20.70	22.94 23.47		

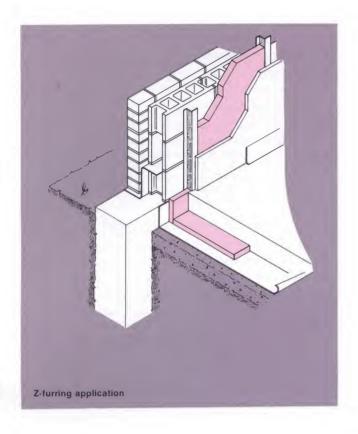
⁽¹⁾ Resistances are calculated, including inside/outside air films, with framing adjustments of 20% for stud spacing at 16" o.c., 15% at 24" o.c., based upon procedures and design values for all components at 75°F mean temperature from 1981 ASHRAE Handbook of Fundamentals except values: from UC Industries at 40°F for FOAMULAR Insulation, from United States Gypsum Company at 75°F for 3½" THERMAFIBER Mineral Fiber Blankets (R-13) in stud cavities and ½" gypsum panel interior finish.

Masonry and concrete walls

Z-furring adapts insulation, interior finish

- accommodates 1, 1½, 2, or 3-in FOAMULAR Insulation
- progressive installation simplifies spacing, attachment
- slotted-web design reduces "shadowing", conducts less heat
- minimizes moisture-transmission, wicking for long-term effectiveness
- fast installation, conventional drywall interior

USG Z-Furring Channels install vertically at 24 in o.c., alternately with 24-in wide FOAMULAR Insulation panels on the interior side of masonry back-up walls. Each panel acts as a spacer for the next channel. Furring channels are galvanized for durability, and have 1¼-in knurled flanges for easy screw attachment of interior panels. Interior surfacing recommended for maximum vapor resistance is ½-in Foil-Back SHEETROCK Brand Gypsum Panels.



Z-furring design thermal resistance "R" (1)

	nom.	FOAMULAR Insulation thickness/R							
wall construction	wall thickn.	no insul.	1" (R-5.41)	1½" (R-8.12)	2" (R-10.82)	3" (R-16.22)			
4" face brick + 4" common brick	8"	2.09	7.95	10.66	13.36	18.76			
poured concrete (140 lb/ft³)	8"	1.49	7.35	10.06	12.76	18.16			
8" cinder block + 4" face brick + 1" stucco	12" 9"	3.01 2.77	8.87 8.63	11.58 11.34	14.28 14.04	19.68 19.44			
12" cinder block + 4" face brick + 1" stucco	16" 13"	3.18 2.94	9.04 8.80	11.75 11.51	14.45 14.21	19.85 19.61			
8" concrete block + 4" face brick + 1" stucco	12" 9"	2.40 2.16	8.26 8.02	10.97 10.73	13.67 13.43	19.07 18.83			
12" concrete block + 4" face brick + 1" stucco	16" 13"	2.57 2.33	8.43 8.19	11.14 10.90	13.84 13.60	19.24 19.00			

(1) Resistances are calculated, including inside/outside air films, based upon procedures and design values for all components at 75°F mean temperature from 1981 ASHRAE Handbook of Fundamentals except values: from UC Industries at 40°F for FOAMULAR Insulation, from United States Gypsum Company at 75°F for ½" gypsum panel interior finish. Thermal conductance of Z-furring channels and gypsum panel fasteners has been excluded from the values shown.

Masonry cavity walls

adjoins cavity, minimizes heat and vapor transmission

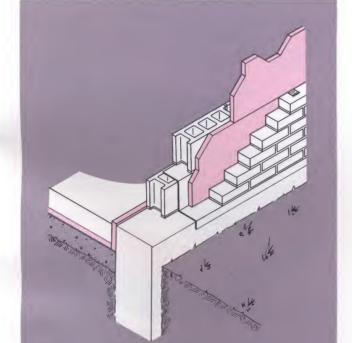
- installs between masonry ties
- thicknesses of 3/4- to 3-in suit any climate
- insulating value unaffected by water leakage
- insulates cavity air space

FOAMULAR Insulation in cavity saves energy by retarding heat transmission, also reduces passage of water vapor. Low absorption also provides long-lasting durability and R- factor. Weep holes through exterior masonry and flashing are required to drain moisture from cavity.

cavity-wall design thermal resistance "R" (1)

	FOAMULAR Insulation thickness/R								
wall construction	no insul.	³ ⁄ ₄ " (R-4.06)	1" (R-5.41)	1½" (R-8.12)	2" (R-10.82)	2½" (R-13.51)	3" (R-16.22		
4" concrete block, air space 8" concrete block	3.57	7.63	8.98	11.69	14.39	17.08	19.79		
4" face brick, air space 4" concrete block	2.90	6.96	8.31	11.02	13.72	16.41	19.12		
4" face brick, air space 8" concrete block	3.30	7.36	8.71	11.42	14.12	16.81	19.52		
4" face brick, air space 8" poured concrete	2.83	6.89	8.24	10.95	13.65	16.34	19.05		

(1) Resistances are calculated, including inside/outside air films and 34'' min. dead air space, based upon procedures and design values for all components at 75''F mean temperature from 1981 ASHRAE Handbook of Fundamentals except value from UC Industries at 40''F for FOAMULAR Insulation.



masonry cavity wall

Foundation walls/slab/perimeters

completes a high-efficiency thermal barrier around exterior walls

- · good strength resists backfill soil pressures
- excellent water-resistance assures long-term durability, performance
- total foundation insulation: foundation and perimeter, under-slab/edge, crawl spaces

FOAMULAR Polystyrene Insulation applied from top of foundation to footing provides significant energy savings atand below-grade. It complements the FOAMULAR Insulation sheathing envelope around building framing. Around concrete or concrete block foundation exterior walls, FOAMULAR Insulation is mechanically or adhesively attached, or held in place with backfill. In areas between bottom of exterior siding and grade it should be protected with reinforced stucco or painted weatherproof board, on the outside and under crawl spaces with SHEETROCK Brand Gypsum Panels or other approved protection.



This map shows the minimum recommended thickness of FOAMULAR Insulation for foundation/perimeter insulation applications.



Flat, single-ply roofs and re-roofing

high insulating performance

- efficient-high R-per-inch
- effective-even when wet
- reduced energy/equipment costs
- increased occupant comfort, building value

FOAMULAR RI Roof Insulation means long-term savings from smaller heating/cooling equipment capacities and lower energy costs, plus improved occupant comfort and building value. Its thermal efficiency and excellent water resistance provide high thermal performance in roofs, where it often counts most. Even when wet, it maintains high insulating value.

efficient roof assembly, on new deck or old roof

- for flat roofs and single-ply roofs
- on new construction or re-roofing
- · saves tear-off of old roofing
- meets Federal Specs, today's energy standards

FOAMULAR RI Roof Insulation, for flat roofs, combines the advantages of single-ply roofing (SPR) membranes and extruded polystyrene. It provides a truly high performance roof, whether new or re-roofed. For re-roofing, it can be applied directly over the old roof, saving both the tear-off cost and additional insulating value of the old roofing. It can also be applied directly to an existing concrete deck, the same as with new construction.



ballasted membrane



mechanically attached membrane

Good design practices

- 1. Certified System Performance—UC Industries will provide test certification for published fire and structural data covering system's designed and constructed according to its published specifications. Tests are conducted on specific products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.
- 2. Jobsite Handling—To protect FOAMULAR Insulation and prevent discoloration caused by excessive exposure to direct sunlight, exterior materials should be applied as soon as practical after sheathing application.
- 3. WARNING! COMBUSTIBLE. FOAMULAR Polystyrene Insulation will ignite if exposed to fire of sufficient heat and intensity, although it does contain a flame-retardant additive to inhibit ignition from small fire sources. This product should be installed only with a thermal barrier such as one-half inch thick gypsum board on the interior side of the wall. See No. 3 of "Limitations" for further instructions. During shipping, storage, installation and use, this product should not be exposed to open flame or other ignition sources.
- 4. Vapor Retarders—Assemblies should be evaluated for effectiveness and location of vapor retarders to avoid condensation and subsequent damage to structures (see current ASHRAE Handbook of Fundamentals).
- 5. Air and Water Infiltration and Water Permeance—Flashing and sealants as shown in the details should be provided to resist air and water infiltration. All gypsum sheathing must be covered with No. 15 asphalt felt to assure watertight construction. Asphalt felt should be applied horizontally with 2" overlap and attached to sheathing. Accessories for stucco finishes should be made of zinc alloy with weep holes 12" o.c.
- 6. Additional Information—These specifications cover normal job requirements for FOAMULAR Polystyrene Insulation. For additional information on United States Gypsum products, see U.S.G. Technical Folders: USG Steel Framing Systems SA-510 and CS-54 for load-bearing steel framing; Building and Acoustical Insulation SA-705 for mineral-fiber insulation; USG Curtain Wall Systems SA-805 for curtain wall studs; Plasters, Bases & Accessories SA-917 for veneer finish products; Gypsum Panels & Accessories SA-927 for interior gypsum drywall components; USG Texture and Paint Products SA-933 for exterior coatings. All folders except CS-54 are found in Sweet's General Building File, copies are available separately through U.S.G. sales offices.

Architectural specifications

Part 1: general

1.1 scope—Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by UC Industries, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

Materials shall be delivered in their original unopened units, stored off the ground, protected from direct sunlight with a

light-colored opaque film and ventilated to prevent excessive temperature. Damaged or deteriorated materials shall be removed from the premises.

Part 2: products

2.1 materials

- a. Insulation
- —FOAMULAR Polystyrene Extruded Foam Panels, () thick, () wide, (8) (9) ft. long, ([all] [short] edges square,) ([all] [long] edges T&G) (select sizes from page 4).
- —THERMAFIBER Mineral Fiber Blankets by United States Gypsum (specify type, R-factor, size from SA-705). (For 1-hr. fire rating, specify: 3%" M-S Blankets for steel studs; 3½" W-S Blankets for wood studs.)
- b. Fasteners
- —For foam insulation, (1½") (2)") (2½") (3") USG Type (R)(S-12) Wafer Head Screws.
- —For self-furring metal lath, 11/4" USG Type S-12 Pancake Head Screws, cadmium-plated.
- —For gypsum panels, 1", 1¼" USG Type(S) (S-12) Bugle Head Screws.
- —For gypsum sheathing, 1" USG Type S-12 Bugle Head Screws.
- —For furring channels, Concrete stub nails, power-driven fasteners or $1\frac{3}{4}$ " TAPCONTM Fasteners.
- —For sheathing wood studs, Staples, galvanized, (7/16") (3/4") crown, 11/2" length; nails, galvanized, (7/16") (1") head, 11/2" length. (Obtain locally.)
- c. Metal Lath—3.4-lb USG Galvanized Self-Furring Junior Diamond Mesh Lath 27" x 96".
- d. Gypsum Panels—(½" SHEETROCK Brand) (½" SHEETROCK Brand Foil-Back) (%" SHEETROCK Brand FIRECODE "C") Gypsum Panels, 48" wide x (max. practical length to minimize end joints) by United States Gypsum.
- e. Gypsum Sheathing—1/2" USG Gypsum Sheathing.
- f. Steel Framing—USG Steel Framing System (specify from SA-510 and -805).
- g. Furring Channel—USG Z-Furring Channel (1") (1½") (2") (3").
- h. Joint Treatment—(select a U.S.G. Joint System).
- Protective Coating—(weatherproof board) (reinforced exterior stucco).

Application of FOAMULAR Insulation to masonry is a simple installation with Z-furring.



j. Adhesive—(water-base for temperatures above 50°F, solvent-base for damp or cold weather as recommended by adhesive manufacturer).

Part 3: execution

3.1 steel frame exterior walls

3.1.1 cold-formed steel framing erection

Erect cold-formed steel framing in accordance with plans and specifications and manufacturer's current printed directions.

3.1.2 gypsum sheathing application

Apply gypsum sheathing to steel stud exterior with panels parallel to studs and vertical joints occurring over studs. Fasten gypsum sheathing with 1" Type S-12 Screws spaced 12" o.c. in field of panels and around edges.

3.1.3 insulating sheathing application

Install flashing and sealants or asphalt felt horizontally with 2" overlap and 6" endlap and fasten as specified. Apply 2-ft. wide FOAMULAR Insulation horizontally with tongue edge up, or 4-ft. wide insulation vertically, direct to steel stud exterior. Fasten panels to studs with Wafer Head Screws spaced max. 12" o.c. and of lengths indicated in table below:

	screw length	
insulation thickness	direct application	application over 1/2" gypsum sheathing
1"	11/2"	2"
11/2"	2"	21/2"
2"	21/2"	3"

At wall perimeter and terminations, install screws $8^{\prime\prime}$ o.c. Cover all framing with panels and fit joints tightly.

For fire-rated construction, apply 2-ft. wide FOAMULAR Insulation horizontally with tongue edge up over gypsum sheathing. Fasten panels to studs with 2" Wafer Head Screws spaced 12" o.c. Cover all gypsum sheathing with panels and fit joints tightly.

3.1.4 exterior metal lath and accessories (see SA-805).

3.1.5 exterior finish application

Apply exterior finish materials with USG Type S-12 Screws providing %" min. penetration into studs. For shingles or vertical siding, apply wood nailing strips horizontally over insulation and fasten to studs; apply shingles or siding to strips. For masonry veneer, provide 1" clear space between back of masonry and face of insulation; install corrosion-resistant masonry ties with cadmium-plated fasteners directly to steel framing. (See SA-917 for stucco specification.)

3.1.6 mineral fiber blanket installation

Install blankets between studs from interior side of wall. These paperless friction-fit blankets should stay in place, held only by friction; do not staple to FOAMULAR Insulation. Provide separate vapor retarder, foil-backed gypsum panels or 4-mil polyethylene film.

3.1.7 gypsum panel application (see SA-913, -923).

3.2 wood frame exterior walls

3.2.1 insulating sheathing application

Apply 2-ft. wide FOAMULAR Insulation horizontally with tongue edge up, or 4-ft wide insulation vertically, to outside of braced framing. For wood study use 7/16° crown staples spaced

8'' o.c., %'' crown staples spaced 12'' o.c., 7/16'' diam. head roofing nails spaced 12'' o.c. or 1'' diam. head nails spaced 24'' o.c. to attach panel.

Cover all framing with panels and fit joints tightly.



Efficient installation means lower installed cost.

3.2.2 exterior finish application

Apply exterior finish materials with fasteners providing ¾" min. penetration into studs. For shingles or vertical siding, apply wood nailing strips horizontally over insulation and fasten to studs; apply shingles or siding to strips. For masonry veneer, provide 1" clear space between back of masonry and face of insulation; install corrosion-resistant masonry ties between joints of FOAMULAR Insulation with corrosion-resistant fasteners driven into studs.

3.2.3 mineral-fiber blanket installation

Install blankets between studs from interior side of wall, recessed slightly from stud faces. Do not staple—friction fit holds blankets in place. Provide separate vapor retarder, foil-backed gypsum panels or 4-mil polyethylene film.

3.2.4 gypsum panel application (see SA-913, -924).

3.3 Z-furring system application

3.3.1 insulation and furring channel erection

Erect FOAMULAR Insulation vertically on concrete and block walls and hold in place with Z-Furring Channels spaced 24" o.c. max. Except at exterior corners, attach narrow flanges of furring channels to wall with concrete stub nails or power-driven fasteners spaced 24" o.c. max. At exterior corners, attach wide flange of furring channel to wall with short flange extending beyond corner. On adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with a standard width insulation panel and continue in the regular manner. At interior corners, space second channel no more then 12" from corner and cut insulation to fit. Apply wood blocking around window and door openings and as required for attachment and support of fixtures and furnishings.

3.3.2 gypsum panel application

Apply gypsum panels parallel to channels with vertical joints occurring over channels and $\frac{1}{4}$ " relief at the floor. Use no end

joints in single-layer application. Attach gypsum panels with 1" Type S Screws spaced 16" o.c. in field of panels and at edges, and with 1\%" Type S Screws spaced 12" o.c. at exterior corners. Finish all gypsum panel joints, internal angles, fasteners and





FOAMULAR Insulation under slab perimeter reduces ground heat losses (top), and on gypsum sheathing/steel studs, provides both a thermal break and a 1-hr fire rating (above).

drywall accessories with a U.S.G. Joint System installed according to manufacturer's directions.

3.4 masonry cavity walls

3.4.1 insulation application

Place insulation between wall ties with long edge horizontal and ends and edges butted. Install insulation against back-up wall allowing ¾" min. air space between insulation and outer wall. Cut insulation with saw or sharp knife to fit tightly around vents, louvers, pipes, conduit and other wall penetrations.

3.5 foundation & perimeter insulation systems

3.5.1 application to exterior of foundation

Before backfilling, install FOAMULAR Insulation to the exterior of all foundation walls above footing. Adhere insulation to clean surfaces with long edges horizontal, edges tightly butted and vertical joints staggered. Secure insulation with adhesive applied to back of panels with 1/4" to 3/6" continuous beads spaced 16" o.c. or 11/2" diameter, 11/2" high spots in rows 8" apart

and spaced 16" o.c. Apply insulation to wall within 15 min. after adhesive is applied. Backfill carefully to prevent damage to insulation. Where insulation is exposed between ground level and bottom of exterior finish, apply reinforced stucco, painted weatherproof board or suitable protective coating over insulation. (See SA-917 for stucco specification.)

3.5.2 application in crawl space

Securely attach wood furring spaced 24" o.c. max. to inside face of foundation walls. Place insulation between furring and cover insulation completely with SHEETROCK Brand Gypsum Panels or approved protection mechanically attached to furring.

3.5.3 application below floor slab

Install FOAMULAR Insulation after gravelfill has been built up to grade and thoroughly tamped, and vapor retarder placed. Lay insulation in place with edges pressed together and butting foundation wall or adjacent vertical insulation. Pour concrete slab to cover all insulation.

3.5.4 application to roof deck

Remove all dirt and debris from roof deck so that surface to receive insulation is clean, smooth and dry. Apply as much roof insulation as can be covered by roofing material the same day.

Apply roof insulation in parallel rows with end joints staggered. Install side and end joints closely but do not force together. In two-layer application, apply second-layer panels parallel to first layer but with side and end joints staggered from those in first. Where roof deck meets vertical surfaces or penetrations, cut insulation accurately to fit without forcing. For mechanically attached roof insulation, use fasteners specified by manufacturer of SPR.

3.5.5 application to existing roofing

Remove all dirt and debris from old roofing, including any loose or protruding roofing pieces, so that surface to receive insulation is clean, smooth and dry. Apply as much roof insulation as can be covered by roofing material the same day.

Apply roof insulation in parallel rows with end joints staggered. Install side and end joints closely but do not force together. In two-layer application, apply second-layer panels parallel to first layer but with side and end joints staggered from those in first. Where roof meets vertical surfaces or penetrations, cut insulation accurately to fit without forcing. For mechanically attached roof insulation, use fasteners specified by manufacturer of SPR.

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(A joint venture between subsidiaries of UNITED STATES GYPSUM COMPANY and CONDEC CORPORATION)

101 South Wacker Drive, Chicago, Illinois 60606

Lightweight framing systems for low-cost exterior walls



system folder



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Lightweight framing systems for exterior walls (non-load bearing)

Exterior walls that offer strength, beauty, economy and versatility

USG Exterior Curtain Wall systems adapt easily to basic design concepts, using conventional materials, methods and equipment. These improved systems have been specified in all parts of the nation for office buildings, schools, shopping centers, motels, hotels and apartments.

Unlimited opportunity for creative design—Exterior stucco surfaces offer textural expression of smooth monolithic surfaces or random sculptural relief. Color and texture can be varied by addition of coarse colored aggregates which contrast boldly with brick, glass and concrete.

Greater selection of surface finishes—Interior and exterior facings in various combinations meet specific functional and esthetic needs.

Reduce danger from fire—2-hour rating (see table), other ratings available.

Reduce airborne street noise—The dampening effect of air space and insulation within the framing cuts noise transmitted to the interior.

Easily designed for high thermal performance—Systems will accommodate energy design requirements for heated and airconditioned buildings. Greater insulation values are attainable in less wall thickness with steel framing than can be attained with block or concrete. For thermal resistance see page 17.

Reduce dead load—Systems cut weight in brick masonry walls by 25%, in textured panel assemblies up to 66% to reduce structural foundation requirements.

Meet water permeance standards—Confirmed by tests, these systems meet ASTM E514 requirements for a Class E water-permeance rating. Where moisture may penetrate stucco, masonry and other exteriors, joints and holes in gypsum sheathing must be sealed or covered to assure watertight construction, (see Good Design Practices).

framing systems

USG Steel Studs, channel types roll-formed in three styles (SJ, CWS, CS) from five thicknesses of steel with corrosion-resistant coating, provide the wall framing with interior drywall, veneer finish and conventional plaster systems. They are an ideal back-up for brick veneer assemblies, reducing dead load 25% in comparison to concrete block backings. Studs are available in many thicknesses, giving a variety of types. The wide choice of stud sizes and spacings accommodates insulation requirements, allows wall heights to 26', wind loads to 40 psf (125 mph), and a variety of building modules. Requirements for greater wall heights and wind loads usually can be met; ask for details.

Studs are anchored at top and bottom in specially designed runners, and THERMAFIBER Insulation is inserted in the cavity.

An alternate framing system uses USG C-H Studs, J-Runners and Gypsum Liner Panels, quickly erected from one side to provide sturdy fire-rated backup curtain walls. Studs and runners are available in 2½" and 4" widths. USG Gypsum Liner Panels have a special fire-resistant core encased in water-resistant paper. Wall heights to



CUNA OFFICE BUILDING, CREDIT UNION CENTER, Madison, Wisconsin. Architects: POTTER, LAWSON & PAWLOWSKY, AIA

15'3", wind loads to 40 psf. All components except curtain wall skin may be erected from inside the building.

See U.S.G. folder SA-510 for load-bearing exterior wall framing.

exterior surfaces

Exterior surfaces may be unit masonry, portland cement-lime stucco or various decorative panels or siding materials. Brick or other masonry units are laid with a mortar of portland cement and BONDCRETE Mason's Lime and secured with brick anchors screwattached through the sheathing to steel studs. This system offers speedier building enclosure, the superior protection of a double-cavity wall and greater variety of insulation options.

Portland cement-BONDCRETE Lime stucco is applied in three coats to a 1" thickness over 3.4-lb. galvanized metal lath. Self-furring metal lath is screw-attached to steel study through USG Gypsum Sheathing.

Ceramic, aggregated or porcelain-enameled panels, prefinished metal siding and other dry exterior facings weighing up to 8 psf are applied over sheathing and screw-attached to studs.

For the C-H Stud System, curtain wall panels are independently supported by attaching to horizontal girts fastened to the structure.

interior surfaces

Interior surfaces may be gypsum drywall, high-strength veneer finish or conventional plaster. Hundreds of variations in finishes ranging from smooth trowel to oriental-style textures, painted or fabric covered, are available for interior design.

With gypsum drywall, where a vapor retarder is required on the warm side, Foil-Back SHEETROCK Brand Gypsum Panels, ½" or ½" thick, are screw-attached to the steel studs. Foil-Back SHEETROCK Brand FIRECODE Gypsum Panels provide additional resistance to fire exposure, are used in assemblies where a fire rating is required.

Veneer finish interiors that require a vapor retarder on the warm side have Foil-Back IMPERIAL Gypsum Base screw-attached to steel

WYNMORE VILLAGE, Coconut Creek (Miami-Ft. Lauderdale), Florida



studs. IMPERIAL Finish or DIAMOND Interior Finish is applied 1/16" to 3/32" thick over this 4-ft, wide base.

For conventional plaster interiors, Foil-Back ROCKLATH Plaster Base is clip or screw-attached to studs and RED TOP Gypsum Plaster is applied ½" thick over the base.

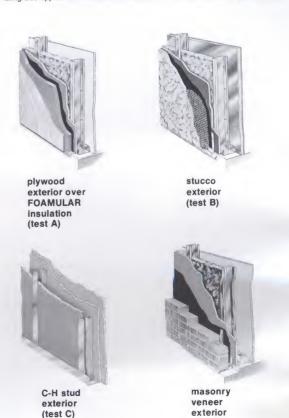
limitations

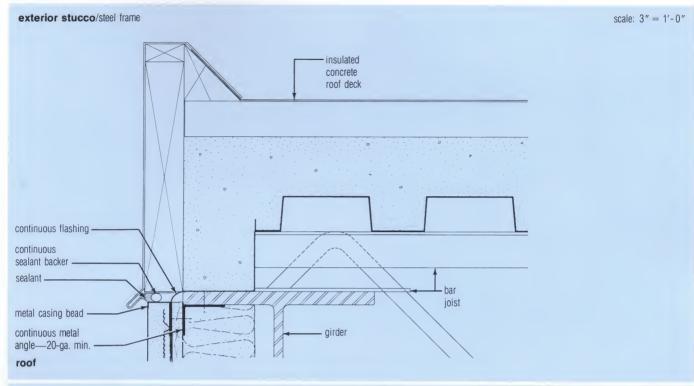
- 1. Non-load bearing constructions.
- 2. All details, specifications, and data computations contained in this literature are intended as a general guide for use in USG Curtain Wall Construction. These products must not be used in design or construction of any structure without complete and detailed evaluation by qualified structural engineers or architects to verify the suitability of these particular products for use in any given structure. Information from this publication should be used only in conjunction with USG Curtain Wall System, as physical properties among competitive products may vary. United States Gypsum Company assumes no liability for failure resulting from the use of its drawings, specifications or computations, or for failure resulting from improper application or installation of the Curtain Wall System.

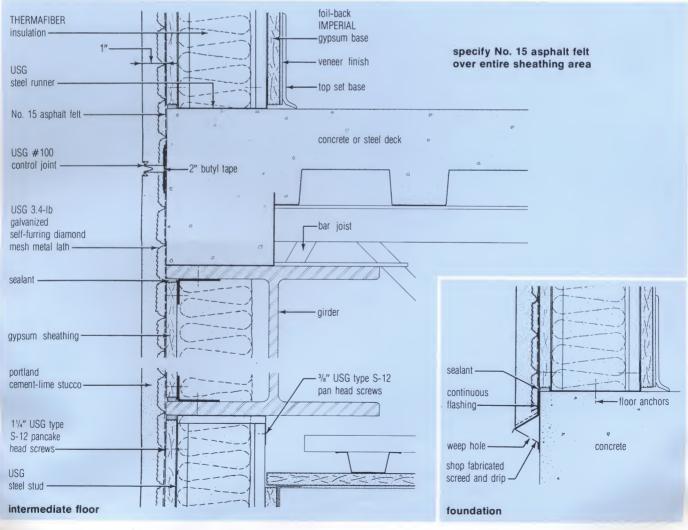
fire ratings

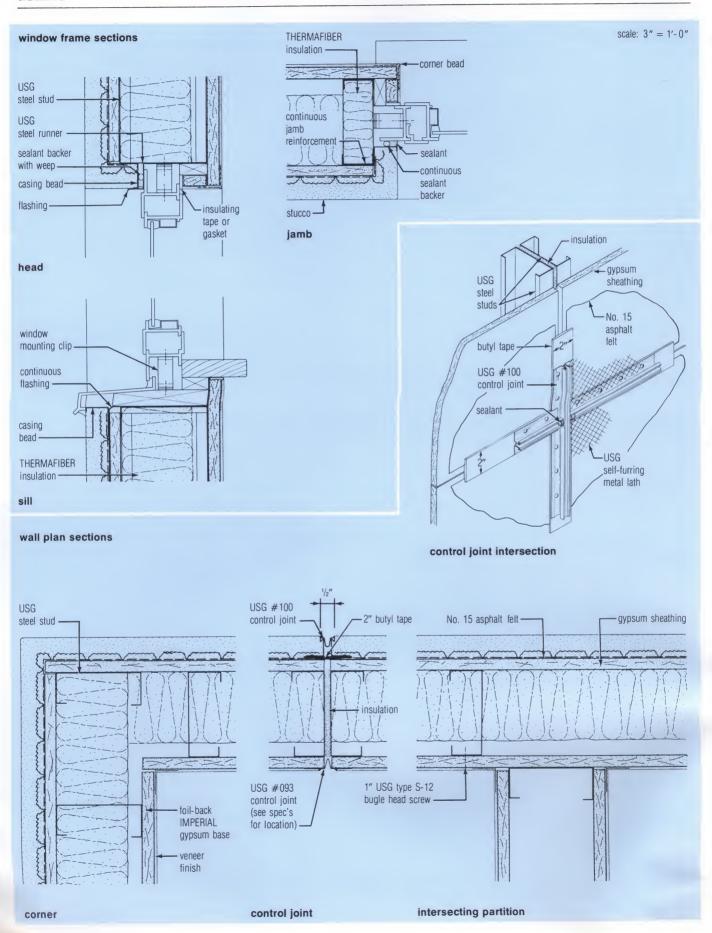
description	test no.	fire rating	
35SJ20 steel studs 24" o.c.—½" gypsum sheathing— 1" FOAMULAR polystyrene insulation installed horizontally —½" cedar plywood exterior—3%" THERMAFIBER M-S blankets between studs—¾" SHEETROCK brand FIRECODE "C" gypsum panel interior—joints finished	CEG 11-9-79	1 hr.	A
358CWS steel studs 16" o.c.—1/2" gypsum sheathing—self-furring metal lath—1" cement-lime stucco exterior 3" THERMAFIBER M-S stud blankets between studs—56" Foil-Back SHEETROCK brand FIRECODE "C" gypsum panels or IMPERIAL FIRECODE "C" gypsum base and 1/16" IMPERIAL finish interior	T-4851-OSU	2 hr.	В
C-H stud system—1" USG liner panels set between USG steel C-H studs on exterior—2 layers SHEETROCK brand FIRECODE "C" gypsum panels screw attached on interior—ioints finished	U of C 4-2-75†	2 hr.	С

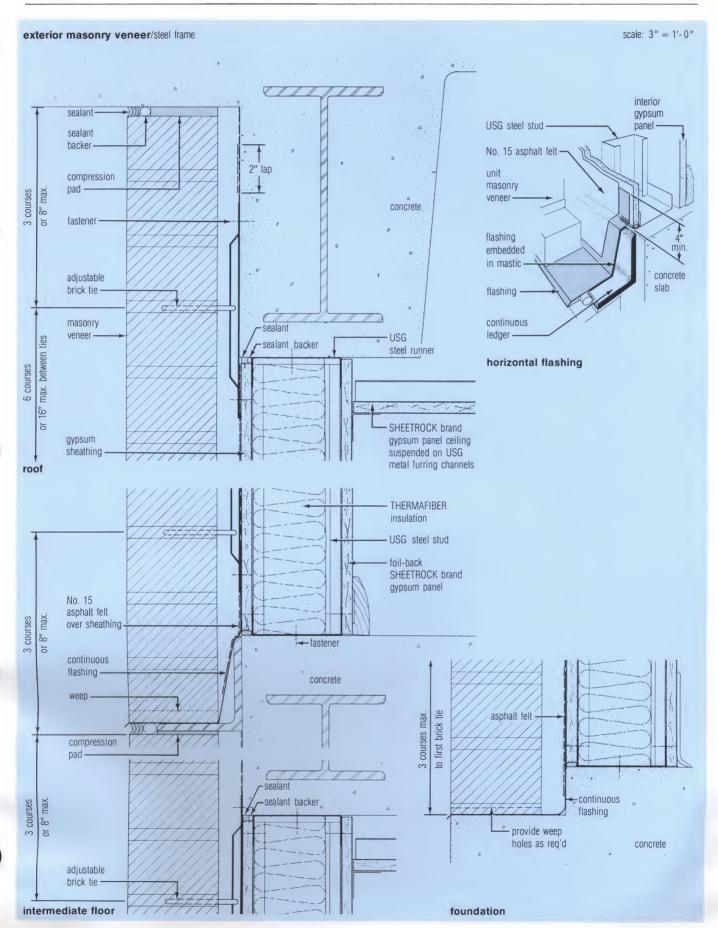
†Fire rating also applies with IMPERIAL FIRECODE "C" Base and veneer finish surface

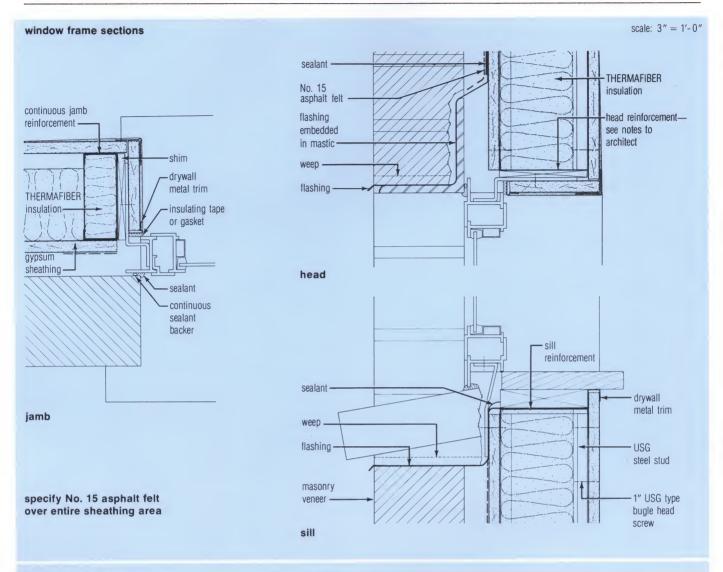


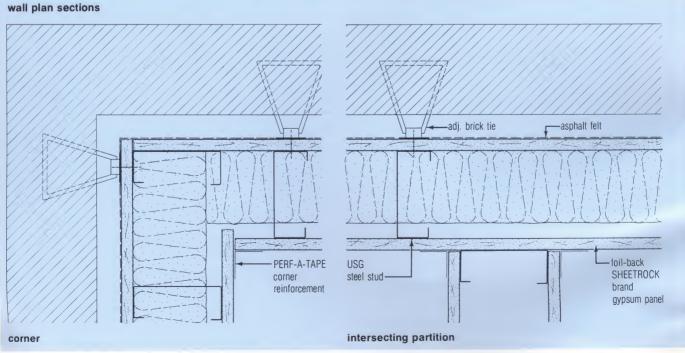


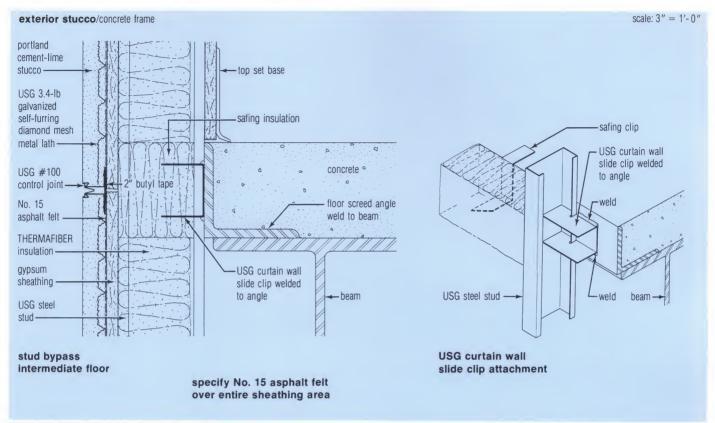


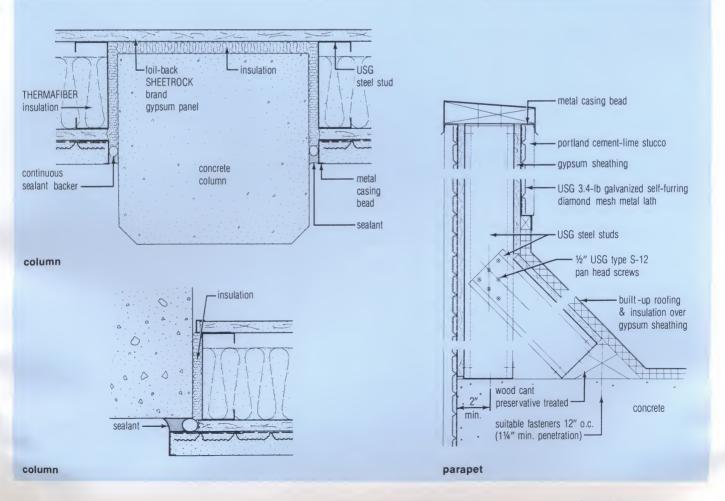


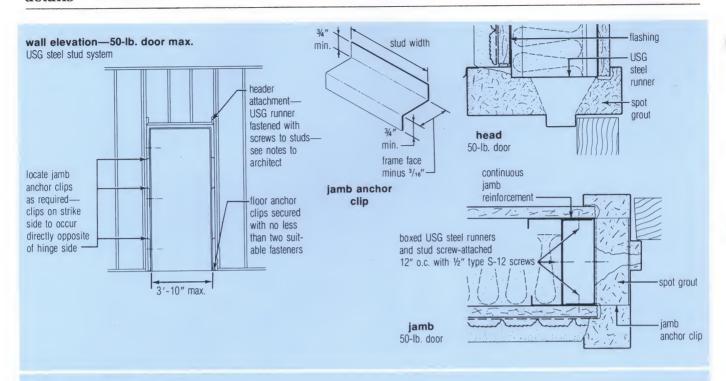


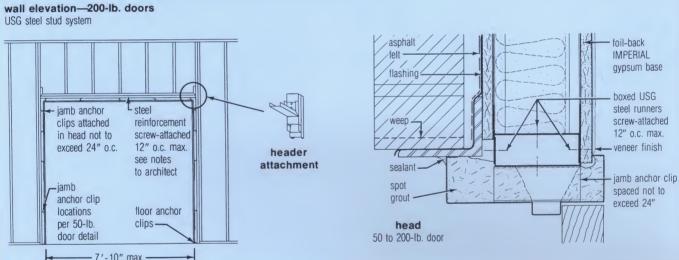


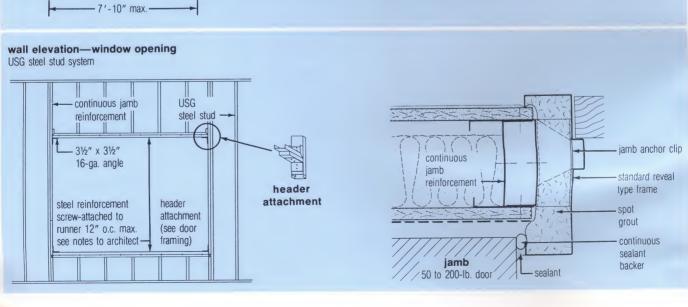


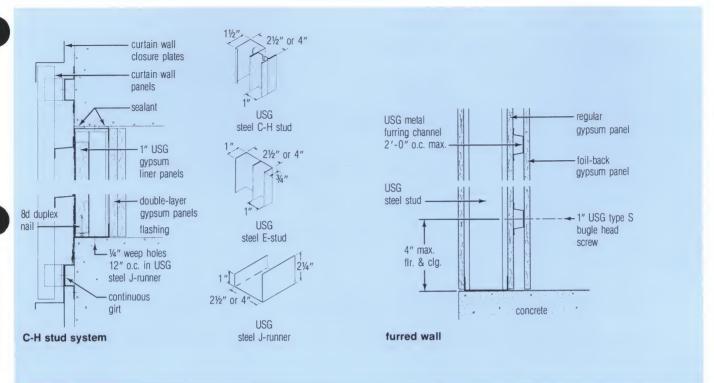


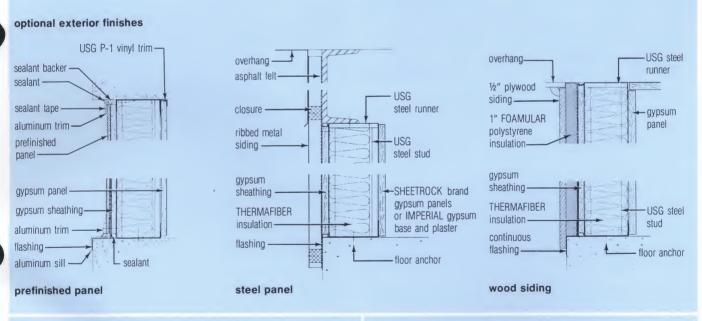


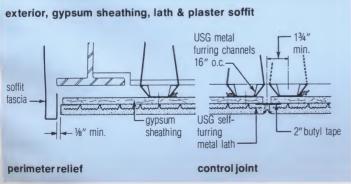


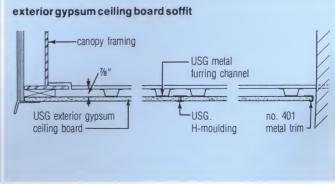












curtain wall—CWS stud (20-ga.)

limiting heights with drywall or plaster interior and exterior facing (1)



design c	riteria	compos	ite wail pr	operties						studp	roperties o	nly					
lm.d	atud	gypsum exterior (and stuc	со		sheathing xterior (L/		¢ .	brick v (L/360	/eneer or s	tucco ext	erior	otherex	terlor fini	sh (L/240))
wind load (psf)	stud spacing (in o.c.)	2½" 212CWS	3%" 358CWS	4" 400CWS	6" 600CWS	2½" 212CWS	3%" 358CWS	4" 400CWS	6" 600CWS	21/2" 212CV	3 ⁵ /8" VS358CWS	4" 400CWS	6" 600CWS	2 ¹ /2" 212CWS	35/8" 358CWS	4" 400CWS	6" 600CWS
15	12	11'3"	14′0″	15′0″	19'6"	10'9"	12'0"	12'9"	15′9″	8'3"	10′9″	11'9"	16'3"	9'3"	12'6"	13'6"	18'6"
(80	16	10'9"	.13′3″	14′3″	18'6"	10'6"	11'9"	12'0"	14′9″	7'6"	10′0″	10'9"	14'9"	8'6"	11'3"	12'3"	17'0"
mph)	24	9'3"	11′6″	12′3″	15'9"	9'3"	10'3"	10'6"	13′0″	6'6"	8′9″	9'3"	13'0"	7'6"	10'0"	10'9"	14'9"
20	12	10'3"	12'9"	13'6"	17'9"	9'9"	11'0"	11'6"	14'3"	7'6"	10′0″	10'9"	14'9"	8'6"	11'3"	12'3"	17'0"
(90	16	9'9"	12'0"	12'9"	16'9"	9'6"	10'6"	11'0"	13'6"	6'9"	9′0″	9'9"	13'6"	7'9"	10'3"	11'0"	15'3"
mph)	24	8'0"	10'3"	11'0"	13'9"	8'0"	9'3"	9'6"	11'9"	6'0"	7′9″	8'6"	11'9"	6'9"	9'0"	9'9"	13'0"
25	12	9'6"	11'9"	12'6"	16'6"	9'0"	10'3"	10'9"	13′3″	7′0″	9′3″	10′0″	13′9″	7′9″	10'6"	11'3"	15′9″
(10C	16	8'9"	11'3"	12'0"	15'0"	8'9"	9'9"	10'3"	12′6″	6′3″	8′3″	9′0″	12′6″	7′3″	9'6"	10'3"	14′3″
mph)	24	7'3"	9'3"	10'0"	12'0"	7'3"	8'6"	9'0"	11′0″	5′6″	7′3″	7′9″	10′6″	6′3″	8'3"	9'0"	10′6″
30	12	8'9"	11'0"	11'9"	15'6"	8'6"	9'6"	10'0"	12'6"	6'6"	8′9″	9′3″	13'0"	7'6"	10'0"	10'9"	14'9"
(110	16	8'0"	10'3"	11'0"	13'9"	8'0"	9'3"	9'6"	11'9"	6'0"	7′9″	8′6″	11'9"	6'9"	9'0"	9'9"	13'0"
mph)	24	6'6"	8'6"	9'0"	10'0"	6'6"	8'0"	8'6"	10'0"	5'3"	6′9″	7′6″	8'9"	6'0"	7'9"	8'6"	8'9"
35	12	8'6"	10'6"	11'3"	14'9"	8′0″	9'0"	9'6"	11'9"	6'3"	8′3″	8′9″	12'3"	7'0"	9′6″	10'3"	14'0"
(120	16	7'6"	9'6"	10'3"	12'9"	7′6″	8'9"	9'0"	11'3"	5'6"	7′6″	8′0″	11'3"	6'6"	8′6″	9'3"	11'3"
mph)	24	6'0"	7'9"	8'3"	8'6"	6′0″	7'9"	8'0"	8'6"	5'0"	6′6″	7′0″	7'6"	5'6"	7′6″	8'0"	7"6"
40	12	8'0"	10'0"	10'9"	13'9"	7'9"	8'9"	9′0″	11'3"	6'0"	7′9″	8'6"	11'9"	6'9"	9′0″	9'9"	13'0"
(125	16	7'0"	9'0"	9'6"	11'3"	7'0"	8'6"	8′9″	10'9"	5'3"	7′0″	7'9"	9'9"	6'0"	8′3″	8'9"	9'9"
mph)	24	5'9"	7'3"	7'9"	7'6"	5'9"	7'3"	7′6″	7'6"	4'9"	6′3″	6'9"	6'6"	5'3"	7′0″	7'6"	6'6"

⁽¹⁾ Stress based on capacity of studs alone (33% increase for wind load). For gypsum sheathing and stucco exteriors (L/360) deflection based on composite wall assembly. For brick veneer exterior, deflection L/600 based on composite wall assembly with noncomposite addition of brick veneer stiffness. For brick veneer, stucco or other exteriors, deflections of L/360 and L/240 based on properties of studs alone. Yield strength for studs and runners is 33 ksi.

curtain wall-C-H stud

limiting heights with interior and exterior facing(1)



design criteria			USG steel studs	or by size and gauge
wind load	defl. limlt	stud spacing (in o.c.)	2½" 212 CH22	4" 400 CH20
5 osf 80 nph)	L/240 L/360	12 24 12 24	11'9" 10'3" 10'3" 9'10"	15'3" 12'6" 13'6" 11'0"
20 osf (90 mph)	L/240 L/360	12 24 12 24	10'6" 9'0" 9'3" 8'3"	14'0" 11'6" 12'3" 10'0"
25 psf (100 mph)	L/240 L/360	12 24 12 24	9'9" 8'0" 8'6"	13'0" 10'6" 11'3" 9'3"
30 psf (110 mph)	L/240 L/360	12 24 12 24	9'3" 	12'3" 9'6" 10'6" 8'9"
35 psf (120 mph)	L/240 L/360	12 24 12 24	8′9″ 	11'6" 8'0" 10'0" 8'0"
40 psf (125 mph)	L/240 L/360	12 24 12 24	8'6" 	11'0" — 9'9" —

⁽¹⁾ Any independently supported exterior treatment: interior is two layers of $\frac{1}{2}$ SHEETROCK Brand Gypsum Panels. Stress based on capacity of studs alone. Deflection based on composite wall assembly without exterior finish.

runner attachment spacing

curtain wall limiting heights

light—using power-driven fastener with capacity of 193-lb. single shear and 200 lb. bearing force, driven into CR22 runner.

	runnerat	tachment spac	cing (in. o.c.)		
	24	20	16	12	8
wind load (psf)	limiting h	elghts for curl	ain wall		
15	11'3"	13'4"	16'6"	23'4"	35'4"
20	8'6"	10'0"	12'9"	16'6"	25′6″
25	6'8"	8'0"	10'0"	13'4"	20'0"
30		6'8"	8'6"	11'3"	16'6"
35			7'2"	9'8"	14'9"
40			6'4"	8'6"	12'9"

medium—using power-driven fastener with capacity of 300-lb. single shear and 300 lb. bearing force, driven into CWR or CR20 runner.

	runner att	achment spac	ing (ln. o.c.)		
	24	20	16	12	8
wind load (psf)	limiting h	eights for curt	ain waii		
15	16'1"	19'2"	23'8"	33'7"	50'4"
20	12'3"	14'4"	18'4"	23'8"	36'8"
25	9'7"	11'6"	14'5"	19'2"	28'9"
30	8'1"	9'7"	12'3"	16′1″	23'8"
35	6'11"	8'5"	10'4"	13′10″	21′3″
40	6'0"	7'2"	9'2"	12'3"	18'4"

heavy—using power-driven fastener with capacity of 400-lb. single shear and 400-lb. bearing force, driven into CR18 runner.

	runner att	achment spac	cing (in. o.c.)		
	24	20	16	12	8
wind load (psf)	llmlting h	eights for curt	ain wali		
15	22'5"	26'8"	32'11"	46'8"	70'0"
20	16'11"	20'0"	25′5″	32'11"	50′11′
25	13'4"	16'0"	20'0"	26'8"	40'0"
30	11'2"	13'4"	17′0″	22'5"	32'11"
35	9'8"	11'8"	14'4"	19'4"	29'6"
40	8'4"	10'0"	12'9"	16'11"	25′5″

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limiting heights with gypsum sheathing and stucco exterior and drywall or plaster interior (1)

composite wall properties

wind	prita	limiting	limiting heights (1) for USG steel studs by size and gauge	1) for US	G steel s	tuds by s	ize and g	ande															
load	spacing	31/2"-355J	S				35/6"-362SJ	2SJ				4"-40SJ	_			51/2"-55SJ	3			6"-60SJ			
(pst)	(in o.c.)	22	20	18	16	14	22	20	18	16	14	20	18	16	14	20	18	16	14	20	18	16	14
15	12	13'6"	14'0"	14'9"	15'6"	16'3"	13'9"	14'6"	15'3"	16'0"	16′9″	15'3"	16'3"	17'0"	18'0"	19'0"	20'3"	21'6"	22'9"	20'3"	21'9"	23'0"	24'3"
(80	16	12'9"	13'3"	14'0"	14'6"	15'3"	13'3"	13'9"	14'3"	15'0"	15′9″	14'6"	15'3"	16'0"	16'9"	18'0"	19'0"	20'0"	21'0"	19'0"	20'3"	21'6"	22'6"
mph)	24	11'3"	11'6"	12'3"	12'9"	13'3"	11'6"	12'0"	12'6"	13'3"	13′9″	12'9"	13'3"	14'0"	14'9"	15'9"	16'9"	17'6"	18'6"	16'9"	17'9"	18'9"	19'9"
20	12	12'3"	12'9"	13'6"	14'0"	14'9"	12'6"	13'0"	13'9"	14'6"	15'3"	14'0"	14'9"	15'6"	16′3″	17'3"	18'6"	19'6"	20'6"	18'6"	19'9"	20'9"	22'0"
(90	16	11'9"	12'0"	12'9"	13'3"	13'9"	12'0"	12'6"	13'0"	13'9"	14'3"	13'3"	13'9"	14'6"	15′3″	16'3"	17'3"	18'3"	19'3"	17'3"	18'6"	19'6"	20'6"
mph)	24	10'3"	10'6"	11'0"	11'6"	12'0"	10'6"	10'9"	11'6"	12'0"	12'6"	11'6"	12'0"	12'9"	13′3″	14'3"	15'0"	16'0"	16'9"	15'3"	16'0"	17'0"	17'9"
25	12	11'3"	11'9"	12'6"	13'0"	13'9"	11'9"	12'3"	12'9"	13'6"	14'3"	13'0"	13′9″	14'6"	15'0"	16'0"	17'3"	18′3″	19'0"	17'3"	18'3"	19′3″	20'6"
(100	16	10'9"	11'3"	11'9"	12'3"	12'9"	11'0"	11'6"	12'0"	12'9"	13'3"	12'3"	13′0″	13'6"	14'3"	15'3"	16'0"	17′0″	17'9"	16'0"	17'0"	18′0″	19'0"
mph)	24	9'6"	9'9"	10'3"	10'9"	11'3"	9'9"	10'0"	10'6"	11'0"	11'6"	10'9"	11′3″	11'9"	12'3"	13'3"	14'0"	14′9″	15'6"	14'0"	15'0"	15′9″	16'6"
30	12	10'9"	11'0"	11'9"	12'3"	13'0"	11'0"	11'6"	12'0"	12'9"	13′3″	12'3"	12′9″	13'6"	14'3"	15'3"	16′0″	17.0"	18'0"	16'0"	17'3"	18'3"	19'3"
(110	16	10'3"	10'6"	11'0"	11'6"	12'0"	10'6"	10'9"	11'6"	12'0"	12′6″	11'6"	12′0″	12'9"	13'3"	14'3"	15′0″	16'0"	16'9"	15'3"	16'0"	17'0"	17'9"
mph)	24	8'9"	9'3"	9'9"	10'3"	10'6"	9'0"	9'6"	10'0"	10'6"	11′0″	10'0"	10′6″	11'0"	11'6"	12'6"	13′3″	14'0"	14'6"	13'3"	14'0"	14'9"	15'6"
35	12	10'3"	10'6"	11'3"	11'9"	12'3"	10'6"	10'9"	11'6"	12'0"	12′9″	11'6"	12'3"	12'9"	13'6"	14'6"	15'3"	16′3″	17'0"	15'3"	16'3"	17'3"	18′3″
(120	16	9'9"	10'0"	10'6"	11'0"	11'6"	10'0"	10'3"	10'9"	11'3"	11′9″	11'0"	11'6"	12'0"	12'9"	13'6"	14'3"	15′3″	16'0"	14'6"	15'3"	16'3"	17′0″
mph)	24	8'0"	8'9"	9'3"	9'9"	10'0"	8'3"	9'0"	9'6"	10'0"	10′3″	9'6"	10'0"	10'6"	11'0"	11'9"	12'6"	13′3″	14'0"	12'0"	13'3"	14'0"	14′9″
40	12	9'9"	10'0"	10'9"	11'3"	11'9"	10′0″	10'6"	11'0"	11'6"	12'0"	11'0"	11′9″	12'3"	13'0"	13'9"	14'9"	15'6"	16′3″	14'9"	15'6"	16'6"	17'6"
(125	16	9'3"	9'6"	10'0"	10'6"	11'0"	9′6″	9'9"	10'3"	10'9"	11'3"	10'6"	11′0″	11'6"	12'0"	13'0"	13'9"	14'6"	15′3″	13'9"	14'6"	15'6"	16'3"
mph)	24	7'6"	8'3"	8'9"	9'3"	9'6"	7′6″	8'6"	9'0"	9'6"	10'0"	9'3"	9′6″	10'0"	10'6"	11'0"	12'0"	12'9"	13′3″	10'6"	12'9"	13'6"	14'3"
(1) Stress based	(1) Stress based on capacity of studs alone (33% increase for wind load). Deflection L'380 based on composite wall assembly. Yield strength for studs is 40 ksi; for runners 33 ksi	ds alone (33	3% increas	e for wind	Hoad). De	flection L/	360 based	ou compo	site wall as	ssembly.	rield streng	ith for stud	s is 40 ksi;	for runner	s 33 ksi.								

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composite wall properties

	wind	stud	limiting height	s (1) for USG s	limiting heights (1) for USG steel studs by size and gauge	and gauge								
	load	spacing	31/2"-35CS			35/8"-362CS			4"-40CS			6"-60CS		
	(bst)	(in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
	15	12	14'0"	14'6"	15'3"	14'6"	15'0"	15'9"	15'3"	16'0"	16'9"	20'6"	21'6"	22'6"
	(80	16	12'6"	13'9"	14′3″	12'9"	14'3"	14'9"	13'9"	15'0"	15'9"	18'6"	20'3"	21'0"
	mph)	24	10′3″	12'0"	12'6"	10,6"	12'6"	13'0"	11'3"	13′3″	13'9"	15'0"	17.6"	18'6"
	20	12	12'6"	13′3″	13'9"	12'9"	13'9"	14'3"	13'9"	14'6"	15'3"	18'6"	19,6"	20,6"
	06)	16	10,8"	12'6"	13.0″	11'0"	13'0"	13'6"	11'9"	13'9"	14'3"	16'0"	18'3"	19'3"
	mph)	24	8,9,,	11.0″	11.6″	.0,6	11'3"	11'9"	.6,6	12.0"	12'6"	13'0"	16′0″	16,9"
	25	12	11'0"	12'3"	12'9"	11'6"	12'9"	13'3"	12'3"	13'6"	14'3"	16'6"	18'3"	19.0″
	(100	16	,6,6	11'9"	12'0"	10,0"	12'0"	12'6"	10'6"	12'9"	13'3"	14'3"	17.0"	17'9"
	mph)	24	7.6,7	10'3"	10'6"	8,0,,	10,6″	11'0"	8,8,,	11'3"	11'6"	11'9"	14'9"	15'6"
ī	30	12	10'3"	11'6"	12.0"	10'6"	12'0"	12'6"	11'3"	12'9"	13'3"	15'0"	17.0"	18'0"
In	(110	16	8,8,,	11.0"	11'6"	9,0,,	11'3"	11'9"	2,6,6	12'0"	12'6"	13'0"	16'0"	16'9"
ito	mph)	24	7.3"	9,3"	10.0″	2.6″	,9,6	10′3″	8,0,,	10′3″	11'0"	10.6″	13'9"	14'9"
d	35	12	9,6	11'0"	11'6"	,6,6	11'3"	11'9"	10'3"	12'0"	12'9"	14'0"	16'3"	17.0"
St.	(120	16	8'3"	10,6"	10'9"	8,6"	10'9"	11'3"	,0,6	11'6"	12'0"	12'0"	15'3"	16'0"
ate	mph)	24	,,6,9	8,6″	3,6″	.6,9	.6,8	,6,6	7'3"	,9,6	10,6"	10,0"	12'9"	14.0"
e (40	12	8,6,″	10'6"	11'0"	,0,6	10'9"	11'3"	9,8,,	11'6"	12'0"	13'0"	15'6"	16'3"
237	(125	16	.9.2	,6,6	10'3"	7,8"	10'3"	10,8"	8,6,,	10,6,	11'3"	11'3"	14'6"	15'3"
ne	mph)	24	6'3"	8,0,,	3,0,,	.9,9	8,3″	9,3"	6,9	,6,8	10,0,,	9'3"	12'0"	13'3"
ım	(1) Stress based on	(1) Stress based on capacity of studs alone (33% increase for wind load). Deflection L/360 based on composite wall assembly. Yield strength for studs is 40 ks; for runners 33 ksi	ne (33% increase	for wind load). D	Deflection L/360 base	ed on composit	e wall assembly. Yi	ield strength for stud	ds is 40 ksi; for ru	nners 33 ksi.				

12′9″	12'0"	11'6"	runners 33 ksi.
12′0″	11'6"	10'9"	
10′3″	9'6"	8'9"	
11′3″ 9′9″ 8′0″	10'3" 9'0" 7'3"	8'6" 6'9"	ds is 40 ksi; for
12'6"	11'9"	11'3"	Yield strength for studs is 40 ksi; for runners 33 ksi.
11'9"	11'3"	10'9"	
10'3"	9'9"	9'3"	
12'0"	11'3"	10'9"	n composite wall assembly.
11'3"	10'9"	10'3"	
9'6"	8'9"	8'3"	
10'6"	9′9″	9′0″	sodwoo uo pası
9'0"	8′6″	7′9″	
7'6"	6′9″	6′6″	
12'0"	11'6"	11'0"	or wind load). Deflection L/360 ba
11'6"	10'9"	10'3"	
10'0"	9'6"	9'0"	
11'6"	11'0"	10'6"	ase for wind load)
11'0"	10'6"	9'9"	
9'3"	8'6"	8'0"	
10′3″	9'6"	8'9"	lone (33% incres
8′9″	8'3"	7'6"	
7′3″	6'9"	6'3"	
12	12	12	capacity of studs a
16	16	16	
24	24	24	
			ess based on c

brick veneer curtain wall-SJ stud

limiting heights with gypsum sheathing and brick veneer exterior and drywall or plaster interior (1)

composite wall properties

		limiting	limiting heights (1) for USG steel studs by size a	1) for US	G steel s	uds by s	ize and gauge	auge															
wind	spacing	31/2"-35	55.7				35/8"-36	-362SJ				4"-40S	7			51/2"-55SJ	S			6"-60SJ			
(pst)	(in o.c.)	22 20	20	18	16	14	22	20	18	16	14	20	18	16	14	20	18	16	14	20	18	16	14
15 (80 mph)	12 16 24	12'0" 11'6" 10'0"	12'3" 11'9" 10'3"	12'9" 12'3" 10'9"	13'6" 12'9" 11'0"	14'0" 13'3" 11'6"	12'0" 11'9" 10'3"	12'6" 12'0" 10'6"	13'0" 12'6" 10'9"	13'9" 13'0" 11'3"	14'3" 13'6" 11'9"	13'0" 12'6" 10'9"	13'9" 13'0" 11'3"	14'6" 13'6" 11'9"	15'0" 14'3" 12'3"	15'6" 14'6" 12'9"	16'6" 15'6" 13'6"	17'9" 16'6" 14'3"	18'9" 17'3" 15'0"	16'6" 15'6" 13'6"	17'6" 16'6" 14'3"	18'9" 17'6" 15'3"	19'9" 18'3" 16'0"
20 (90 mph)	12 16 24	10'9" 10'6" 9'0"	11'0" 10'9" 9'3"	11'9" 11'0" 9'9"	12'3" 11'6" 10'0"	12'9" 12'0" 10'6"	11'0" 10'6" 9'3"	11'3" 10'9" 9'6"	12'0" 11'3" 9'9"	12'6" 11'9" 10'3"	13'0" 12'3" 10'9"	11'9" 11'3" 9'9"	12'6" 11'9" 10'3"	13'0" 12'3" 10'9"	13'9" 12'9" 11'3"	14'3" 13'3" 11'6"	15'0" 14'0" 12'3"	16'0" 15'0" 13'0"	17'0" 15'9" 13'9"	15'0" 14'0" 12'3"	16′0″ 15′0″ 13′0″	17'0" 15'9" 13'9"	18'0" 16'9" 14'6"
25 (100 mph)	12 16 24	10'0" 9'9" 8'6"	10'3" 10'0" 8'9"	10′9″ 10′3″ 9′0″	11'3" 10'9" 9'3"	11'9" 11'0" 9'9"	10'3" 9'9" 8'6"	10'6" 10'0" 8'9"	11'0" 10'6" 9'3"	11'6" 11'0" 9'6"	12'0" 11'3" 10'0"	11'0" 10'6" 9'3"	11'6" 11'0" 9'6"	12'3" 11'6" 10'0"	12'9" 12'0" 10'6"	13'3" 12'3" 10'9"	14'0" 13'0" 11'6"	15′0″ 13′9″ 12′0″	15'9" 14'6" 12'9"	13'9" 13'0" 11'3"	14′9″ 13′9″ 12′0″	15'9" 14'9" 12'9"	16'9" 15'6" 13'6"
30 (110 mph)	12 16 24	9,6 8,0 ,,0	0,00 """,0,00 """,0,00	10'3" 9'9" 8'6"	10'9" 10'0" 8'9"	11'0" 10'6" 9'3"	9'6"	10'0" 9'6" 8'3"	10'6" 9'9" 8'9"	10'9" 10'3" 9'0"	11′3″ 10′9″ 9′3″	10'3" 9'9" 8'6"	11'0" 10'3" 9'0"	11'6" 10'9" 9'6"	12'0" 11'3" 9'9"	12'3" 11'6" 10'3"	13′3″ 12′3″ 10′9″	14'0" 13'0" 11'6"	14'9" 13'9" 12'0"	13'0" 12'3" 10'9"	14'0" 13'0" 11'3"	15'0" 13'9" 12'0"	15'9" 14'6" 12'9"
35 (120 mph)	12 16 24	9'0" 8'9" 7'6"	9'3"	9'9"	10'0" 9'6" 8'3"	10'6" 10'0" 8'9"	9′3″ 8′9″ 7′9″	9'6" 9'0" 7'9"	9′9″ 9′6″ 8′3″	10'3" 9'9" 8'6"	10′9″ 10′3″ 8′9″	9'9" 9'3" 8'3"	10′3″ 9′9″ 8′6″	10'9" 10'3" 9'0"	11'6" 10'9" 9'3"	11'9" 11'0" 9'9"	12'6" 11'9" 10'3"	13'3" 12'3" 10'9"	14'0" 13'0" 11'6"	12'6" 11'6" 10'3"	13'3" 12'3" 10'9"	14'3" 13'0" 11'6"	15'0" 13'9" 12'0"
40 (125 mph)	12 16 24	8'6" 8'3" 7'3"	8'9" 8'6" 7'6"	9'3" 8'9" 7'9"	9,9"	10'0" 9'6" 8'3"	8′9″ 8′6″ 7′3″	9'0" 8'6" 7'6"	9'6" 9'0" 7'9"	10'0" 9'3" 8'3"	10'3" 9'9" 8'6"	9'6"	10'0" 9'3" 8'3"	10'6" 9'9" 8'6"	11'0" 10'3" 9'0"	11'3" 10'6" 9'3"	12'0" 11'3" 9'9"	12′9″ 11′9″ 10′3″	13'6" 12'6" 11'0"	11'9" 11'0" 9'9"	12′9″ 11′9″ 10′3″	13'6" 12'6" 11'0"	14'3" 13'3" 11'6"
															-								

⁽¹⁾ Stress based on capacity of studs alone (33% increase for wind load). Deflection L 600 based on composite wall assembly with noncomposite addition of brick veneer stiffness. Yield strength for studs is 40 ksi; for runners 33 ksi.

brick veneer curtain wall-CS stud

limiting heights with gypsum sheathing and brick veneer exterior and drywall or plaster interior (1)

composite wall properties

wind	pita	limiting height	limiting heights (1) for USG steel studs by	-	size and gauge								
ioad	spacing	31/2"-35CS			35/8"-362CS			4"-40CS			6"-60CS	,	
(bst)	(in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
15	12	12'3"	12'9"	13′3″	12'6"	13.0"	13'6"	13'0"	13'6"	14'3"	16'6"	17'6"	18'6"
(80	16	11'9"	12'0"	12'6"	12'0"	12'3"	12'9"	12'6"	12'9"	13'3"	15'6"	16'3"	17.0″
(ydm	24	10′3″	10,6"	11.0″	10,6"	10.9"	11'0"	10'9"	11'3"	11'9"	13'6"	14'3"	15'0"
20	12	11'0"	11'6"	12'0"	11'3"	11'9"	12′3″	11'9"	12'3"	12'9"	15'0"	15'9"	16'9"
06)	16	10,8″	11'0"	11'3"	10'9"	11'3"	11'6"	11'3"	11'9"	12'0"	14'0"	14'9"	15'6"
mph)	24	8,3,,	3,6″	10.0″	.0,6	,6,6	10,0,,	,6,6	10'3"	10,6"	12'3"	13'0"	13'6"
25	12	10'3"	10'9"	11.0"	10'6"	11'0"	11'3"	11.0″	11'6"	12'0"	14'0"	14'9"	15'6"
(100	16	3,6,6	10′3″	10'6"	10,0″	10,6"	10,8"	10'6"	10/9"	11'3"	13'0"	13'9"	14'6"
(hdm	24	7,6,7	9,0,,	9,3"	8,0,,	,0,6	,9,6	6.8	,9,6	3,6,6	11'6"	12'0"	12'6"
30	12	9,6,	10,0,,	10'6"	10,0,,	10'3"	10'9"	10'3"	10'9"	11'3"	13'3"	13'9"	14'9"
(110	16	8,8,,	,,9,6	10,0,,	,0,6	.6,6	10.0"	.6,6	10'3"	10,6"	12'3"	13.0"	13'6"
(hdm	24	7.3"	8,3″	8,8″	9.2	,9,8	8,9,,	8,0,,	.0.6	9'3"	10'9"	11'3"	11'9"
35	12	9'3"	,,9,6	10,0"	9,6,,	9,6,″	10'3"	9,6,	10'3"	10'9"	12'6"	13′3″	14'0"
(120	16	8'3"	,,0,6	.9,6	8,6"	9,3"	.9,6	,0,6	,6,6	10,0,,	11'9"	12'3"	13'0"
(hdm	24	.6,9	8,0,,	8'3"	6,9	8.0″	,,9,8	7.3"	8,6″	8,9,,	10,0″	10,9"	11'3"
40	12	8,9″	,,0,6	,9,6	9,0,,	9'3"	,6,6	9,6″	9,8"	10/3"	12'0"	12'6"	13'3"
(125	16	.9.2	8,9″	,0,6	7.6,7	8'9"	9,3"	8,6"	9,3"	,,9,6	11'3"	11'9"	12'3"
(hdm	24	6'3"	2,6"	7.6″	,,9,9	7.6,2	8.0,,	.6,9	8,0,,	8,6″	9,3"	10'3"	10,6,

(1) Stress based on capacity of studis alone (33% increase for wind load). Deflection L 600 based on composite wall assembly with noncomposite addition of brick veneer stiffness. Yield strength for studis is 40 ksi; for runners 33 ksi.

	נ
curtain wall—SJ stud	limiting heights with gypsum sheathing with any exterior and drywall or plaster interior (1)

stud properties only

design criteria	riteria		limiting	limiting heights (1) for USG steel studs by siz	1) for US	G steel s	tuds by s	ize and gauge	ande															
	1000	stud	316"-35	2.5				35/8"-3625J	SJ				4"-40SJ				51/2"-55SJ	7.			6"-60SJ			
wind	deflection	spacing (in o.c.)	22 2	20	18	16	14	22	20	18	16	14	20	18	16	14	20	18	16	14	20	18	16	14
15 psf (80	L/240	12 16 24	12'0" 11'0" 9'6"	12'9" 11'9" 10'3"	14'0" 12'9" 11'3"	15'3" 13'9" 12'0"	16'3" 14'9" 13'0"	12'6" 11'6" 10'0"	13'3" 12'0" 10'6"	14'6" 13'3" 11'6"	15'9" 14'3" 12'6"	16'9" 15'3" 13'3"	14'3" 13'0" 11'3"	15'9" 14'3" 12'6"	17'0" 15'6" 13'6"	18'3" 16'6" 14'6"	18'6" 16'9" 14'9"	20′3″ 18′6″ 16′0″	22'0" 20'0" 17'6"	23'6" 21'3" 18'9"	19'9" 18'0" 15'9"	21'9" 19'9" 17'3"	23'6" 21'6" 18'9"	25'3" 23'0" 20'0"
(ydm	N360	12 16 24	10'6" 9'6" 8'6"	11.3" 10.3" 9.0"	12'3" 11'3" 9'9"	13'3" 12'0" 10'6"	14'3" 13'0" 11'3"	11'0" 10'0" 8'9"	11'9" 10'6" 9'3"	12'9" 11'6" 10'0"	13'9" 12'6" 11'0"	14'9" 13'3" 11'9"	12'6" 11'3" 10'0"	13'9" 12'6" 10'9"	14'9" 13'6" 11'9"	15'9" 14'6" 12'6"	16'3" 14'9" 12'9"	17'9" 16'0" 14'0"	19'3" 17'6" 15'3"	20'6" 18'9" 16'3"	17'3" 15'9" 13'9"	19'0" 17'3" 15'0"	20'6" 18'9" 16'3"	22'0" 20'0" 17'6"
20 psf (90	L/240	12 16 24	11.0" 10.0" 8.9"	11'9" 10'9" 9'3"	12′9″ 11′9″ 10′3″	13'9" 12'6" 11'0"	14'9" 13'6" 11'9"	11'3" 10'3" 9'0"	12'0" 11'0" 9'6"	13'3" 12'0" 10'6"	14'3" 13'0" 11'3"	15'3" 14'0" 12'3"	13'0" 11'9" 10'3"	14'3" 13'0" 11'3"	15'6" 14'0" 12'3"	16'6" 15'0" 13'0"	16'9" 15'3" 13'3"	18'6" 16'9" 14'6"	20'0" 18'0" 15'9"	21'3" 19'6" 17'0"	18'0" 16'6" 14'3"	19'9" 18'0" 15'9"	21'6" 19'6" 17'0"	23'0" 20'9" 18'3"
(ydw	7/360	12 16 24	9'6'' 8'9'' 7'6''	10'3" 9'3" 8'0"	11'3" 10'3" 8'9"	12'0" 11'0" 9'6"	13'0" 11'9" 10'3"	10'0" 9'0" 8'0"	10'6" 9'6" 8'6"	11'6" 10'6" 9'3"	12'6" 11'3" 10'0"	13'3" 12'3" 10'6"	11'3" 10'3" 9'0"	12'6" 11'3" 10'0"	13'6" 12'3" 10'9"	14'6" 13'0" 11'6"	14'9" 13'3" 11'9"	16'0" 14'6" 12'9"	17'6" 15'9" 13'9"	18'9" 17'0" 14'9"	15'9" 14'3" 12'6"	17'3" 15'9" 13'9"	18'9" 17'0" 14'9"	20'0" 18'3" 16'0"
25 psf (100	L/240	12 16 24	10'3" 9'3" 8'0"	10'9" 9'9" 8'6"	12'0" 10'9" 9'6"	12'9" 11'9" 10'3"	13'9" 12'6" 11'0"	10'6" 9'6" 8'6"	11'3" 10'3" 9'0"	12'3" 11'3" 9'9"	13'3" 12'0" 10'6"	14'3" 13'0" 11'3"	12'0" 11'0" 9'6"	13'3" 12'0" 10'6"	14'3" 13'0" 11'3"	15'3" 14'0" 12'3"	15'6" 14'3" 12'6"	17'0" 15'6" 13'6"	18'6" 16'9" 14'9"	19'9" 18'0" 15'9"	16'9" 15'3" 13'3"	18'3" 16'9" 14'6"	19'9" 18'0" 15'9"	21'3" 19'3" 17'0"
(ydw	N360	12 16 24	9.0"	9'6"	10'6" 9'6" 8'3"	11'3" 10'3" 9'0"	12'0" 11'0" 9'6"	9'3" 8'6" 7'3"	9,0,,	10'9" 9'9" 8'6"	11'6" 10'6" 9'3"	12'6" 11'3" 9'9"	10'6" 9'6" 8'6"	11'6" 10'6" 9'3"	12'6" 11'3" 10'0"	13'3" 12'3" 10'6"	13'9" 12'6" 10'9"	15'0" 13'6" 11'9"	16'3" 14'9" 12'9"	17'3" 15'9" 13'9"	14'6" 13'3" 11'6"	16'0" 14'6" 12'9"	17'3" 15'9" 13'9"	18'6" 17'0" 14'9"
30 psf (110	L/240	12 16 24	9'6"	10'3" 9'3" 8'0"	11'3" 10'3" 8'9"	12'0" 11'0" 9'6"	13'0" 11'9" 10'3"	10'0'' 9'0'' 8'0''	10'6" 9'6" 8'6"	11'6" 10'6" 9'3"	12'6" 11'3" 10'0"	13'3" 12'3" 10'6"	11'3" 10'3 9'0"	12'6" 11'3" 10'0"	13'6" 12'3" 10'9"	14'6" 13'0" 11'6"	14'9" 13'3" 11'9"	16'0" 14'6" 12'9"	17'6" 15'9" 13'9"	18'9" 17'0" 14'9"	15'9" 14'3" 12'6"	17'3" 15'9" 13'9"	18'9" 17'0" 14'9"	20'0" 18'3" 16'0"
(hdm	L/360	15 16 24	8'6" 7'6" 6'9"	9.0″ 8.0″ 7.0″	9'9"	10'6" 9'6" 8'3"	11'3" 10'3" 9'0"	8'9" 8'0" 7'0"	9′3″ 8′6″ 7′3″	10'0" 9'3" 8'0"	11'0" 10'0" 8'9"	11'9" 10'6" 9'3"	10'0" 9'0" 8'0"	10′9″ 10′0″ 8′9″	11′9″ 10′9″ 9′3″	12'6" 11'6" 10'0"	12'9" 11'9" 10'3"	14'0" 12'9" 11'3"	15'3" 13'9" 12'0"	16'3" 14'9" 13'0"	13'9" 12'6" 11'0"	15'0" 13'9" 12'0"	16'3" 14'9" 13'0"	17'6" 16'0" 14'0"
35 psf (120	L/240	12 16 24	9'0" 8'3" 7'3"	9'9', 7'9',	10'6" 9'9" 8'6"	11'6" 10'6" 9'0"	12'3" 11'3" 9'9"	9'6" 8'6" 7'6"	10'0" 9'3" 8'0"	11'0" 10'0" 8'9"	11'9" 10'9" 9'6"	12'9" 11'6" 10'0"	10′9″ 9′9″ 8′6″	11'9" 10'9" 9'6"	12'9" 11'6" 10'3"	13'9" 12'6" 10'9"	14'0" 12'9" 11'0"	15'3" 14'0" 12'0"	16'6" 15'0" 13'3"	17'9" 16'0" 14'0"	15'0" 13'6" 11'0"	16'6" 15'0" 13'0"	17'9" 16'3" 14'0"	19'0" 17'3" 15'0"
(hdm	098/7	15 16 25	8′0″ 7′3″ 6′3″	8'6" 7'9" 6'9"	9'3" 8'6" 7'3"	10'0' 9'0'' 8'0''	10'9" 9'9" 8'6"	8′3″ 7′6″ 6′6″	8′9″ 8′0″ 7′0″	9'6" 8'9" 7'6"	10'3" 9'6" 8'3"	11'0" 10'0" 8'9"	9.6″ 8'6″ 7'6″	10′3 9′6″ 8′3″	11'3" 10'3" 8'9"	12'0" 10'9" 9'6"	12'3" 11'0" 9'9"	13'3" 12'3" 10'6"	14'6" 13'3" 11'6"	15'6" 14'0" 12'3"	13'0" 11'9" 10'3"	14'3" 13'0" 11'3"	15'6" 14'0" 12'3"	16'6" 15'0" 13'3"
40 psf (125	L/240	12 16 24	8′9″ 8′0″ 7′0″	9.3"	10'3" 9'3" 8'0"	11'0" 10'0" 8'9"	11'9" 10'9" 9'3"	9'0" 8'3" 7'0"	9'6" 8'9" 7'6"	10'6" 9'6" 8'3"	11'3" 10'3" 9'0"	12'3" 11'0" 9'9"	10'3" 9'6" 8'3"	11'3" 10'3" 9'0"	12'3" 11'0" 9'9"	13'0" 12'0" 10'6"	13′3″ 12′0″ 10′0″	14'6" 13'3" 11'6"	15'9" 14'6" 12'6"	17'0" 15'6" 13'6"	14'3" 13'0" 9'9"	15'9" 14'3" 12'6"	17'0" 15'6" 13'6"	18'3" 16'6" 14'6"
(hdm	096/7	12 16 24	7.6"	8'0" 7'3" 6'6"	8'9" 8'0" 7'0"	9'6'' 8'9''	10'3" 9'3" 8'3"	8'0" 7'3" 6'3"	8'6" 7'9" 6'9"	9'3" 8'3" 7'3"	10'0" 9'0" 8'0"	10'6" 9'9" 8'6"	9'0" 8'3" 7'3"	10'0" 9'0" 7'9"	10'9" 9'9" 8'6"	11'6" 10'6" 9'0"	11'9" 10'6" 9'3"	12'9" 11'6" 10'3"	13'9" 12'6" 11'0"	14'9" 13'6" 11'9"	12'6" 11'3" 9'9"	13'9" 12'6" 10'9"	14'9" 13'6" 11'9"	16'0" 14'6" 12'6"
(1) April 2	(1) Any independently an interested any arise the attained prior transmit and attained Based on propose	order of the state		over over	outo miles	thing Bac	00000		ande abut	with etroe	acoroni ac	rise of et use stone with etrace increased 33%, for wind loading. Viald etranath for	ipeol boim.	y Viold	trenath fo	4 si spiris	O ksi: for n	studs is 40 ksi; for runners 33 ksi	ksi.					

curtain wall—CS stud

limiting heights with gypsum sheathing with any exterior and drywall or plaster interior (1)

stud properties only

design criteria	riteria	7	limiting heigh	limiting heights (1) for USG steel studs by		size and gauge								
wind	deflection	spacing	31/2"-35CS			35/8"-362CS			4"-40CS			6"-60CS		
load	limitation	(in o.c.)	18	16	14	18	16	14	18	16	14	18	16	14
15 psf (80	L/240	12 16 24	12'9" 11'9" 10'3"	13'9" 12'6" 11'0"	14'9" 13'6" 11'9"	13'3" 12'0" 10'6"	14'3" 13'0" 11'3"	15'3" 13'9" 12'0"	14'3" 13'0" 11'3"	15'3" 14'0" 12'3"	16′6″ 15′0″ 13′0″	20'0" 18'3" 15'0"	21'6" 19'6" 17'0"	23'0" 21'0" 18'3"
(ydw	L/360	12 16 24	11′3″ 10′3″ 9′0″	12'0" 11'0" 9'6"	12'9" 11'9" 10'3"	11'6" 10'6" 9'3"	12'6" 11'3" 9'9"	13'3" 12'0" 10'6"	12'6" 11'3" 10'0"	13'6" 12'3" 10'9"	14'3" 13'0" 11'6"	17'6" 16'0" 13'9"	18'9" 17'0" 15'0"	20'3" 18'3" 16'0"
20 psf (90 mph)	L/240 L/360	24 16 12 16 16	11.9" 10'6" 10'3" 9'3"	12'6" 11'3" 10'0" 11'0"	13'6" 12'3" 10'6" 11'9"	12'0" 11'0" 9'0" 10'6"	13'0" 11'9" 10'3" 11'3"	13'9" 12'6" 11'0" 11'0"	11.9° 11.9°	14'0" 12'9" 11'0" 12'3"	15'0" 13'6" 11'9" 13'0"	18'3" 16'0" 16'0" 14'6"	19'6" 17'9" 15'6" 17'0"	21'0" 19'0" 16'9" 18'3"
25 psf (100	L/240	24 16 24	8'0" 10'9" 7'9"	8'9" 11'6" 10'6" 9'3"	9'3" 12'6" 11'3" 9'9"	11.3" 10'0" 8'0"	9'0" 12'0" 11'0" 9'6"	9'6" 12'9" 10'3"	9'0"	13.0″ 11.9″ 10.3″	10'3" 13'9" 12'6" 11'0"	12'6" 16'6" 14'3" 11'9"	13'6" 18'3" 16'6"	14'6" 19'6" 17'9" 15'6"
(hdm	T/360	12 16 24	9'6" 8'6" 7'6"	10′3″ 9′3″ 8′0″	10'9" 9'9" 8'6"	9,6,° 1,0,° 1,0,°	10'6" 9'6" 8'3"	11'3" 10'3" 9'0"	10'6" 9'6" 8'3"	11/3" 10/3" 9/0"	12'0" 11'0" 9'6"	14'9" 13'6" 11'9"	15'9" 14'6" 12'6"	17'0" 15'6" 13'6"
30 psf (110 mph)	L/240	12 16 12 12	10'3" 8'9" 7'3" 9'0"	11'0" 10'0" 8'9" 9'6"	11.9"	10'6" 9'0" 7'6" 9'3"	10.3" 0.0"	12'0 11'0" 9'6"	111'3" 9'9" 8'0"	12/3" 11/0" 9'9" 10'9"	13.0" 11.9" 10.3" 11'6"	15.0" 13.0" 10'9"	17'0" 15'6" 13'6" 15'0"	18'3" 16'9" 14'6"
35 psf	L/360 L/240	16 12 16	7,0"	7'6" 10'3" 9'6"	8'0" 11'0"	71.3%	9'0" 7'9" 10'9" 9'9"	9'6" 8'6" 11'6"	9'0" 7'9" 10'6"	9'9', 8'6", 11'6",	10'3" 9'0" 12'6" 11'3"	12'6" 10'9" 14'0" 12'0"	13'6" 11'9" 16'3" 14'9"	14'6" 12'9" 17'6" 15'9"
(hqm	T/360	24 16 24	8 & G & G & G & G & G & G & G & G & G &	9.0%	0,0°,0°,0°,0°,0°,0°,0°,0°,0°,0°,0°,0°,0°	6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6	8'6" 9'6" 7'6"	9'3" 10'0" 8'0"	7'3" 9'6" 7'3"	9'3" 10'0" 9'3" 8'0"	9'9" 10'9" 8'6"	10'0" 13'3" 12'0" 10'0"	12'9" 12'9" 11'3"	13'9" 15'3" 12'0"
40 psf (125	L/240	12 16 24	8'9" 7'6" 6'3"	10′0″ 9′0″ 7′9″	10'6" 9'9" 8'6"	9′0″ 7′9″ 6′6″	10'3" 9'3" 8'3"	11′0″ 10′0″ 8′9″	9.8,	11.0" 10'0" 8'9"	11'9" 10'9" 9'6"	13.0″ 11.3″ 9.3″	15'6" 14'0" 12'0"	16′9″ 15′0″ 13′3″
find	7360	12 16 24	8'0" 7'3" 6'3"	7.9"	9,3"	8'3" 7'6" 6'6"	9'0" 8'3" 7'0"	9,6″ 8,9″ 7,9″	9.0″ 8.3″ 6.9″	9.0%	10/3" 9'6" 8'3"	12'6" 11'3" 9'3"	13'6" 12'3" 10'9"	14'6" 13'3" 11'6"

(1) Any independently supported exterior treatment over gypsum sheathing. Based on properties of studs alone with stress increased 33% for wind loading. Yield strength for studs is 40 ksi; for runners 33 ksi.

technical data

thermal properties (1)

thickness (in)	product	lb/ft³	"R"
2-5	THERMAFIBER Curtain Wall Insulation CW 40 (2)	4.0	4.00 (3)
11/2-31/2	THERMAFIBER Curtain Wall Insulation CW 70 (2)	6.0	4.17 (3)
1-21/2	THERMAFIBER Curtain Wall Insulation CW 90 (2)	8.0	4.35 (3)
1/2	SHEETROCK Brand Gypsum Panels	50.0	0.45
5/8	SHEETROCK Brand Gypsum Panels	50.0	0.56
3/8	ROCKLATH Plaster Base	50.0	0.32
1/2	USG Gypsum Sheathing	50.0	0.45
3/4-2	FOAMULAR Polystyrene Insulation	1.7	5.0 (3)

(1) All factors from 1981 ASHRAE Guide, Factors at 75F mean temperature. (2) Factors from U.S.G. data. (3) Per inch thickness.

product identification

Steel framing carries a three-part code that identifies the size $(35-3\frac{1}{2}", 55-5\frac{1}{2}",$ etc.), style (SJ, CS, CH, CWS-studs; CR, JR, CWR-runners) and steel gauge thickness except CWS and CWR (see table).

physical properties

	size, style,	dimen	sion			metal thick,	net area	avg. wt.
stud system	& ga.	Α	В	С	D	t (1)	sq. in. (2)	MLF (3)
kC+	212CWS	21/2	1.250	1.328	0.328	0.0344	0.184	730
* [] *D	358CWS	35/8"	1.250	1.328	0.328	0.0344	0.223	850
1	400CWS	4"	1.250	1.328	0.328	0.0344	0.236	900
À	600CWS	6"	1.250	1.328	0.328	0.0344	0.305	1,170
1-4-1								
IT.								
⊬B∗								
k-C-	35SJ22	3.421	1.552	1.724	0.500	0.0299	0.176	801
X	35SJ20	3.421	1.552	1.724	0.500	0.0359	0.210	951
1	35SJ18	3.421	1.552	1.724	0.500	0.0478	0.277	1,217
A I	35SJ16	3.421	1.552	1.724	0.625	0.0598	0.359	1,562
- - -	35SJ14	3.421	1.552	1.724	0.625	0.0747	0.442	1,961
	362SJ22	3.573	1.552	1.724	0.500	0.0299	0.181	817
⊬B→	362SJ20	3.573	1.552	1.724	0.500	0.0359	0.216	970
LPJ	362SJ18	3.573	1.552	1.724	0.500	0.0478	0.285	1,243
	362SJ16	3.573	1.552	1.724	0.625	0.0598	0.368	1,593
	362SJ14	3.573	1.552	1.724	0.625	0.0747	0.454	2,000
	40SJ20	3.921	1.552	1.724	0.500	0.0359	0.228	1,015
	40SJ18	3.921	1.552	1.724	0.500	0.0478	0.301	1,301
	40SJ16	3.921	1.552	1.724	0.625	0.0598	0.388	1,666
	40SJ14	3.921	1.552	1.724	0.625	0.0747	0.480	2,093
	55SJ20	5.421	1.552	1.724	0.500	0.0359	0.282	1,209
	55SJ18	5.421	1.552	1.724	0.500	0.0478	0.373	1,551
	55SJ16	5.421	1.552	1.724	0.625	0.0598	0.478	1,978
	55SJ14	5.421	1.552	1.724	0.625	0.0747	0.592	2,489
	60SJ20	5.921	1.552	1.724	0.500	0.0359	0.300	1,274
	60SJ18	5.921	1.552	1.724	0.500	0.0478	0.397	1,634
	60SJ16	5.921	1.552	1.724	0.625	0.0598	0.508	2,082
	60SJ14	5.921	1.552	1.724	0.625	0.0747	0.629	2,621
k-c-∤	35CS18	3.421	1.296	1.375		0.0478	0.210	983
*	35CS16	3.421	1.296	1.375		0.0598	0.261	1,222
	35CS14	3.421	1.296	1.375		0.0747	0.323	1,540
A	362CS18	3.573	1.296	1.375		0.0478	0.217	1,008
-*-t	362CS16	3.573	1.296	1.375		0.0598	0.270	1,254
<u> </u>	362CS14	3.573	1.296	1.375		0.0747	0.335	1,580
k-B→	40CS18	3.921	1.296	1.375	_	0.0478	0.234	1,066
, ,	40CS16	3.921	1.296	1.375		0.0598	0.291	1,326
	40CS14	3.921	1.296	1.375	-	0.0747	0.361	1,672
	60CS18	5.921	1.296	1.375		0.0478	0.330	1,399
	60CS16	5.921	1.296	1.375		0.0598	0.411	1,743
	60CS14	5.921	1.296	1.375	_	0.0747	0.510	2,201

(1) Design thickness without coating. (2) Excluding coating. (3) Average shipping weight including coating per 1000 lin. ft.

thickness-steel components (1)

	design (2	2)	minimum		
style	in	mm	in	mm	gauge(3)
SJ, CS, CR 22 CH22 CWS, CWR CS. SJ. JR. CR. CH 20	0.0299 0.0310 0.0344 0.0359	0.76 0.79 0.87 0.91	0.0284 0.0294 0.0329 0.0341	0.72 0.75 0.84 0.87	22 22 20 20
SJ, CS, CR 18 SJ, CS, CR 16 SJ, CS, CR 14	0.0339 0.0478 0.0598 0.0747	1.21 1.52 1.90	0.0454 0.0568 0.0710	1.15 1.44 1.80	18 16 14

(1) Uncoated steel thickness; meets ASTM A568. Studs meet ASTM C645. Coatings are hot-dip galvanized per ASTM A525; aluminized per ASTM A463. or 55% aluminum-zinc. (2) Conforms to AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition. (3) For information only; refer to limiting height and structural properties table for design data.

structural properties (1)

Y 212CWS 0.186 0.147 1.005 0.040 0.045 0.472 19.8 358CWS 0.441 0.241 1.406 0.045 0.046 0.457 19.8 400CWS 0.556 0.275 1.536 0.046 0.046 0.451 19.5 600CWS 1.472 0.487 2.198 0.047 0.047 0.419 19.3 19.3 15.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.	stud system	stud	lx in⁴	Sx in³	rx in	ly in⁴	Sy in³	ry in	allow. bending stress- ksi ⁽²⁾
X -	Y	212CWS	0.186	0.147	1.005	0.040	0.045	0.472	19.8
Y 35SJ22 0.405 0.222 1.376 0.047 0.047 0.419 19.3									
X -	!								
Y 35SJ22 0.405 0.222 1.376 0.070 0.068 0.626 23.2 3.5 3.5 J20 0.488 0.277 1.373 0.083 0.081 0.623 24.0 35SJ18 0.639 0.364 1.367 0.108 0.104 0.618 24.0 35SJ16 0.806 0.459 1.355 0.143 0.144 0.631 24.0 35SJ16 0.806 0.459 1.355 0.143 0.144 0.631 24.0 35SJ16 0.806 0.459 1.355 0.143 0.144 0.631 24.0 362SJ22 0.449 0.235 1.432 0.072 0.068 0.624 23.0 362SJ20 0.541 0.293 1.429 0.085 0.082 0.621 24.0 362SJ16 0.894 0.487 1.411 0.147 0.146 0.629 24.0 40SJ18 0.882 0.439 1.550 0.117 0.108 0.611 24.0 40SJ18 0.882 0.439 1.550 0.117 0.108 0.611 24.0 40SJ18 0.882 0.439 1.550 0.117 0.108 0.611 24.0 40SJ16 1.116 0.555 1.539 0.157 0.150 0.626 24.0 40SJ16 1.367 0.680 1.532 0.189 0.181 0.619 24.0 55SJ20 1.448 0.520 2.083 0.100 0.084 0.595 21.4 55SJ18 1.903 0.688 2.076 0.139 0.113 0.589 23.3 55SJ16 2.419 0.874 2.071 0.187 0.160 0.605 24.0 60SJ18 2.351 0.779 2.246 0.144 0.114 0.581 22.7 60SJ16 2.90 0.991 2.243 0.195 0.161 0.598 24.0 60SJ16 3.950 0.991 2.243 0.195 0.161 0.598 24.0 60SJ16 2.90 0.991 2.243 0.195 0.161 0.598 24.0 60SJ16 0.661 0.364 1.372 0.050 0.052 0.048 17.0 362CS16 0.661 0.364 1.372 0.050 0.052 0.048 17.0 362CS16 0.661 0.364 1.372 0.050 0.052 0.040 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.040 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.040 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.040 17.0 40CS16 0.828 0.416 1.489 0.053 0.058 0.066 0.400 19.9 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 0.272 0.759 2	!!								
35S.220									
X——X 35SJ18 0.639 0.364 1.367 0.108 0.104 0.618 24.0 35SJ16 0.806 0.459 1.355 0.143 0.144 0.631 24.0 35SJ14 0.986 0.561 1.348 0.173 0.174 0.624 24.0 362SJ22 0.449 0.235 1.432 0.072 0.068 0.624 22.0 362SJ22 0.449 0.235 1.432 0.072 0.068 0.624 22.0 362SJ28 0.541 0.293 1.429 0.085 0.082 0.621 24.0 362SJ16 0.894 0.487 1.411 0.147 0.146 0.629 24.0 362SJ16 0.894 0.487 1.411 0.147 0.146 0.629 24.0 362SJ14 1.094 0.596 1.404 0.178 0.176 0.622 24.0 40SJ20 0.673 0.333 1.556 0.091 0.083 0.617 23.5 40SJ18 0.882 0.439 1.555 0.117 0.108 0.611 24.0 40SJ18 0.882 0.439 1.555 0.117 0.108 0.611 24.0 40SJ16 1.116 0.555 1.539 0.157 0.150 0.626 24.0 40SJ16 1.367 0.680 1.532 0.189 0.181 0.619 24.0 55SJ20 1.448 0.520 2.083 0.100 0.084 0.595 21.4 55SJ18 1.903 0.688 2.076 0.139 0.113 0.589 23.3 55SJ16 2.419 0.874 2.071 0.187 0.160 0.605 24.0 60SJ20 1.787 0.588 2.253 0.100 0.084 0.587 20.6 60SJ18 2.351 0.779 2.246 0.144 0.114 0.588 24.0 60SJ16 2.990 0.991 2.243 0.195 0.161 0.598 24.0 60SJ14 3.679 1.219 2.234 0.236 0.197 0.591 24.0 40CS18 0.895 0.392 1.321 0.049 0.051 0.411 17.0 35CS18 0.482 0.277 1.326 0.040 0.061 0.063 0.409 19.9 60SJ14 3.679 1.219 2.234 0.236 0.197 0.591 24.0 40CS18 0.690 0.337 1.495 0.043 0.043 0.404 12.6 40CS18 0.802 0.416 1.489 0.053 0.053 0.402 17.0 40CS18 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS18 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.040 17.0 40CS16 0.828 0.416 1.489 0.055 0.066 0.040 0.919 0.051 0.051 0.051 0.052 0.040 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.040 17.0 40CS16 0.828 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0	Υ	35SJ22	0.405	0.222	1.376	0.070	0.068	0.626	23.2
X -		35SJ20	0.488	0.277	1.373	0.083	0.081	0.623	24.0
35SJ14 0.986 0.561 1.348 0.173 0.174 0.624 24.0 362SJ22 0.449 0.235 1.432 0.072 0.068 0.624 23.0 362SJ22 0.541 0.293 1.429 0.085 0.082 0.621 24.0 362SJ18 0.708 0.386 1.423 0.111 0.106 0.616 24.0 362SJ18 0.708 0.386 1.423 0.111 0.106 0.616 24.0 362SJ14 1.094 0.596 1.404 0.178 0.176 0.622 24.0 40SJ20 0.673 0.333 1.556 0.091 0.083 0.617 23.5 40SJ16 1.116 0.555 1.539 0.157 0.150 0.626 24.0 40SJ16 1.116 0.555 1.539 0.157 0.150 0.626 24.0 40SJ14 1.396 0.680 1.532 0.189 0.181 0.619 24.0 55SJ18 1.903 0.688 2.076 0.139 0.113 0.589 23.3 55SJ16 2.419 0.874 2.071 0.187 0.160 0.605 24.0 55SJ16 2.974 0.598 2.076 0.139 0.113 0.589 23.3 55SJ16 2.419 0.874 2.071 0.187 0.160 0.605 24.0 60SJ18 2.351 0.779 2.246 0.144 0.114 0.581 22.7 60SJ18 2.931 0.799 2.246 0.144 0.114 0.581 22.7 60SJ18 2.931 0.799 2.246 0.144 0.114 0.581 22.7 60SJ14 3.679 1.219 2.234 0.236 0.197 0.598 24.0 60SJ14 3.679 1.219 2.234 0.236 0.197 0.598 24.0 40CS18 0.650 0.337 1.266 0.040 0.062 0.409 19.9 35CS18 0.482 0.277 1.326 0.040 0.061 0.411 17.0 35CS18 0.482 0.277 1.326 0.040 0.061 0.411 17.0 35CS18 0.482 0.277 1.326 0.040 0.061 0.410 1.26 36CCS14 0.812 0.447 1.366 0.062 0.064 0.040 19.9 40CS16 0.828 0.416 1.489 0.053 0.053 0.040 17.0 40CS16 0.828 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0		35SJ18	0.639	0.364	1.367	0.108	0.104	0.618	24.0
\$\frac{1}{4}\$\$\frac{1}{362SJ122}\$\$\begin{array}{cccccccccccccccccccccccccccccccccccc	v v	35SJ16	0.806	0.459	1.355	0.143	0.144	0.631	24.0
Y 362SJ20 0.541 0.293 1.429 0.085 0.082 0.621 24.0 362SJ18 0.708 0.386 1.423 0.111 0.106 0.616 24.0 362SJ16 0.894 0.487 1.411 0.147 0.146 0.622 24.0 362SJ14 1.094 0.596 1.404 0.178 0.176 0.622 24.5 40SJ18 0.882 0.439 1.550 0.117 0.108 0.611 24.5 40SJ16 1.116 0.555 1.539 0.157 0.150 0.626 24.0 40SJ16 1.116 0.555 1.539 0.157 0.150 0.626 24.0 40SJ16 1.16 0.555 1.539 0.157 0.150 0.626 24.0 40SJ16 1.367 0.680 1.532 0.189 0.181 0.619 24.0 40SJ14 1.367 0.680 1.532 0.189 0.181 0.619 24.0	XX	35SJ14	0.986	0.561	1.348	0.173	0.174	0.624	
Y 362SJ18 0.708 0.386 1.423 0.111 0.106 0.616 24.0 362SJ16 0.894 0.487 1.411 0.147 0.146 0.629 24.0 362SJ14 1.094 0.596 1.404 0.178 0.176 0.622 24.0 40SJ18 0.882 0.439 1.550 0.091 0.083 0.617 23.5 40SJ16 1.116 0.555 1.539 0.157 0.150 0.626 24.0 40SJ14 1.367 0.680 1.532 0.189 0.181 0.619 24.0 55SJ20 1.448 0.520 2.083 0.100 0.084 0.595 21.4 55SJ16 2.419 0.874 2.071 0.187 0.160 0.605 24.0 55SJ14 2.974 1.075 2.063 0.227 0.194 0.598 23.3 55SJ14 2.974 1.075 2.063 0.227 0.194 0.598 24.0	111	362SJ22	0.449	0.235	1.432	0.072			23.0
362SJ16 0.894 0.487 1.411 0.147 0.146 0.629 24.0 362SJ14 1.094 0.596 1.404 0.178 0.176 0.622 24.0 40SJ20 0.673 0.333 1.556 0.091 0.083 0.617 29.5 40SJ18 0.882 0.439 1.550 0.117 0.108 0.611 24.0 40SJ16 1.116 0.555 1.539 0.157 0.150 0.626 24.0 40SJ14 1.367 0.680 1.532 0.189 0.181 0.619 24.0 55SJ20 1.448 0.520 2.083 0.100 0.084 0.595 21.4 55SJ18 1.903 0.688 2.076 0.139 0.113 0.589 23.3 55SJ16 2.419 0.874 2.071 0.187 0.160 0.605 24.0 55SJ14 2.974 1.075 2.063 0.227 0.194 0.598 24.0 60SJ20 1.787 0.588 2.253 0.100 0.084 0.587 20.6 60SJ218 2.351 0.779 2.246 0.144 0.114 0.581 22.7 60SJ16 2.990 0.991 2.243 0.195 0.161 0.598 24.0 60SJ14 3.679 1.219 2.234 0.236 0.197 0.591 24.0 7 35CS18 0.482 0.277 1.326 0.040 0.041 0.413 12.6 60SJ3 362CS16 0.661 0.364 1.372 0.050 0.062 0.409 19.9 35CS18 0.482 0.277 1.326 0.040 0.061 0.411 17.0 362CS18 0.595 0.342 1.321 0.049 0.051 0.411 17.0 362CS18 0.595 0.342 1.321 0.049 0.051 0.411 17.0 362CS18 0.595 0.342 1.321 0.049 0.061 0.409 19.9 40CS18 0.670 0.337 1.495 0.043 0.043 0.404 12.6 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS16 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6	ب	362SJ20	0.541	0.293	1.429	0.085	0.082	0.621	24.0
362SJ16 0.894 0.487 1.411 0.147 0.146 0.629 24.0 362SJ14 1.094 0.596 1.404 0.178 0.176 0.622 24.0 40SJ20 0.673 0.333 1.556 0.091 0.083 0.617 29.5 40SJ18 0.882 0.439 1.550 0.117 0.108 0.611 24.0 40SJ16 1.116 0.555 1.539 0.157 0.150 0.626 24.0 40SJ14 1.367 0.680 1.532 0.189 0.181 0.619 24.0 55SJ20 1.448 0.520 2.083 0.100 0.084 0.595 21.4 55SJ18 1.903 0.688 2.076 0.139 0.113 0.589 23.3 55SJ16 2.419 0.874 2.071 0.187 0.160 0.605 24.0 55SJ14 2.974 1.075 2.063 0.227 0.194 0.598 24.0 60SJ20 1.787 0.588 2.253 0.100 0.084 0.587 20.6 60SJ218 2.351 0.779 2.246 0.144 0.114 0.581 22.7 60SJ16 2.990 0.991 2.243 0.195 0.161 0.598 24.0 60SJ14 3.679 1.219 2.234 0.236 0.197 0.591 24.0 7 35CS18 0.482 0.277 1.326 0.040 0.041 0.413 12.6 60SJ3 362CS16 0.661 0.364 1.372 0.050 0.062 0.409 19.9 35CS18 0.482 0.277 1.326 0.040 0.061 0.411 17.0 362CS18 0.595 0.342 1.321 0.049 0.051 0.411 17.0 362CS18 0.595 0.342 1.321 0.049 0.051 0.411 17.0 362CS18 0.595 0.342 1.321 0.049 0.061 0.409 19.9 40CS18 0.670 0.337 1.495 0.043 0.043 0.404 12.6 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS16 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6	Ý	362SJ18	0.708	0.386	1.423	0.111	0.106	0.616	24.0
No.		362SJ16	0.894	0.487	1.411	0.147	0.146	0.629	
Name		362SJ14	1.094	0.596	1.404	0.178	0.176	0.622	24.0
A0SJ16		40SJ20	0.673	0.333	1.556	0.091	0.083	0.617	23.5
Name		40SJ18	0.882	0.439	1.550	0.117	0.108	0.611	24.0
\$\begin{array}{c c c c c c c c c c c c c c c c c c c		40SJ16	1.116	0.555	1.539	0.157	0.150	0.626	24.0
\$\begin{array}{c c c c c c c c c c c c c c c c c c c		40SJ14	1.367	0.680	1.532	0.189	0.181	0.619	24.0
X - X		55SJ20	1.448	0.520	2.083	0.100	0.084	0.595	21.4
Name		55SJ18	1.903	0.688	2.076	0.139	0.113	0.589	23.3
**No. 1.0		55SJ16	2.419	0.874					
Columbia		55SJ14	2.974	1.075		0.227		0.598	24.0
X		60SJ20	1.787	0.588	2.253	0.100	0.084	0.587	20.6
X X 35CS18 0.482 0.277 1.326 0.040 0.041 0.413 12.6 35CS16 0.595 0.342 1.321 0.049 0.051 0.411 17.0 35CS14 0.731 0.420 1.314 0.060 0.063 0.409 19.9 362CS16 0.661 0.364 1.372 0.050 0.052 0.408 17.0 362CS16 0.610 0.337 1.495 0.043 0.043 0.404 12.6 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS16 1.832 0.612 2.145 0.052 0.064 0.400 19.9 60CS16 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0		60SJ18	2.351	0.779	2.246	0.144	0.114	0.581	
XX 35CS18 0.482 0.277 1.326 0.040 0.041 0.413 12.6 35CS16 0.595 0.342 1.321 0.049 0.051 0.411 17.0 35CS14 0.731 0.420 1.314 0.060 0.063 0.409 19.9 362CS18 0.535 0.295 1.378 0.041 0.042 0.410 12.6 362CS14 0.812 0.447 1.366 0.062 0.064 0.064 0.406 19.9 40CS18 0.670 0.337 1.495 0.043 0.043 0.043 0.040 12.6 40CS16 0.828 0.416 1.489 0.053 0.053 0.053 0.402 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.066 0.400 19.9 40CS18 1.832 0.612 1.483 0.065 0.066 0.400 19.9 60CS18 1.832 0.612 2.145 0.052 0.077 0.371 1.26 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0		60SJ16		0.991	2.243	0.195	0.161		
X——X 35CS16 0.595 0.342 1.321 0.049 0.051 0.411 17.0 35CS14 0.731 0.420 1.314 0.060 0.063 0.049 19.9 12.6 362CS18 0.661 0.364 1.372 0.050 0.052 0.408 17.0 362CS14 0.812 0.447 1.366 0.062 0.064 0.064 0.060 1.40CS16 0.828 0.416 1.489 0.053 0.053 0.053 0.402 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.066 0.066 0.060 1.70 1.70 1.80CS16 0.828 0.612 1.483 0.065 0.066 0.067 0.047 0.371 1.26 60CS18 1.832 0.612 2.145 0.052 0.064 0.058 0.369 17.0		60SJ14	3.679	1.219	2.234	0.236	0.197	0.591	24.0
X——X 35CS16 0.595 0.342 1.321 0.049 0.051 0.411 17.0 35CS14 0.731 0.420 1.314 0.060 0.063 0.049 19.9 12.6 362CS18 0.661 0.364 1.372 0.050 0.052 0.408 17.0 362CS14 0.812 0.447 1.366 0.062 0.064 0.064 0.060 1.40CS16 0.828 0.416 1.489 0.053 0.053 0.053 0.402 17.0 40CS16 0.828 0.416 1.489 0.053 0.053 0.066 0.066 0.060 1.70 1.70 1.80CS16 0.828 0.612 1.483 0.065 0.066 0.067 0.047 0.371 1.26 60CS18 1.832 0.612 2.145 0.052 0.064 0.058 0.369 17.0	Y	35CS18	0.482	0.277	1.326	0.040	0.041	0.413	12.6
X	i			0.342	1.321	0.049	0.051	0.411	17.0
X	T	35CS14	0.731	0.420	1.314	0.060	0.063	0.409	19.9
362CS16 0.661 0.364 1.372 0.050 0.052 0.408 17.0 362CS14 0.812 0.447 1.366 0.062 0.064 0.406 19.9 40CS18 0.670 0.337 1.495 0.043 0.043 0.404 12.6 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS14 1.018 0.512 1.483 0.065 0.066 0.400 19.9 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0	v								
362CS14 0.812 0.447 1.366 0.062 0.064 0.406 19.9 40CS18 0.670 0.337 1.495 0.043 0.043 0.404 12.6 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS14 1.018 0.512 1.483 0.065 0.066 0.400 19.9 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0					1.372	0.050	0.052	0.408	17.0
40CS18 0.670 0.337 1.495 0.043 0.043 0.404 12.6 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS14 1.018 0.512 1.483 0.065 0.066 0.400 19.9 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0		362CS14	0.812	0.447	1.366	0.062	0.064	0.406	19.9
Ý 40CS16 0.828 0.416 1.489 0.053 0.053 0.402 17.0 40CS14 1.018 0.512 1.483 0.065 0.066 0.400 19.9 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0		40CS18	0.670	0.337	1.495	0.043	0.043	0.404	12.6
40CS14 1.018 0.512 1.483 0.065 0.066 0.400 19.9 60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0	Ý	40CS16	0.828	0.416	1.489	0.053	0.053	0.402	17.0
60CS18 1.832 0.612 2.145 0.052 0.047 0.371 12.6 60CS16 2.272 0.759 2.139 0.064 0.058 0.369 17.0				0.512	1.483	0.065	0.066	0.400	19.9
		60CS18		0.612	2.145	0.052	0.047	0.371	12.6
		60CS16	2.272	0.759	2.139	0.064	0.058	0.369	17.0
			2.806			0.078	0.072	0.367	19.9

(1) Yield strength: CWS, CWR and CR styles, 33 ksi; SJ and CS styles, 40 ksi. (2) Assuming full lateral support. For laterally unbraced flexural member, see Sec. 3.3, AISI Specifications

good design practices

1. System Performance—These specifications are for exterior non-load bearing curtain wall systems using USG Steel Framing and securely attached interior and exterior facings. They are presented as a general guide to the architect or structural engineer in preparing project specifications. These systems must not be used without prior structural design by a qualified engineer or architect.

U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Test are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.

Maximum allowable wall heights, stud spacings, and runner attachment spacings are shown in Technical Data, pages 12 to 16. Select values and insert in the specifications. Limiting heights may be increased by using composite design that results in greater material economy, see tables based on composite wall properties. Brick veneer must be structurally supported at every floor with a soft joint below the ledger angle. In continuous curtain wall by-pass construction, contact your U.S.G. Technical Sales Representative for load and performance data on the USG Curtain Wall Slide Clip. For welding data and panelization methods, refer to CS-54 Steel Framing Systems Manual.

2. Fasteners—Specify Type S screws for 20 and 22-ga. steel framing and Type S-12 for 14 to 18-ga. framing, except on interior, specify Type S-12 for 20-ga. framing. Corrosion-resistant cadmium-plated screws should be used for screw-attaching all exterior materials.

3. Window and Door Openings—Framing for window, door and other wall penetrations should have additional reinforcement at the header, sill and jambs to transfer and support all applicable loads. Design should be checked for structural adequacy. Exterior door frames should be spot grouted with portland cement plaster.

4. Shadowing and Spotting—During periods of low outside temperature, condensation may form on outside walls, collecting airborne dirt to produce shadowing and spotting over fasteners and furring. This is a natural phenomenon which occurs through no fault in the products.

Where temperature, humidity and soiling conditions are expected to cause objectionable shadowing and spotting, one of the following alternatives should be considered:

a. The interior facing of Foil-Back SHEETROCK Brand Panels should be furred from the studs using a base layer of panels screw-attached to the studs and horizontally applied USG Metal Furring Channels spaced 24" o.c. (see details, page 11).

b. For maximum resistance to shadowing and spotting, a separate free-standing wall construction is recommended using studs that are independent of the exterior studs and membrane.

5. Expansion and Contraction—Curtain wall surfaces should be isolated with control joints or other means where: (a) curtain wall abuts a structural element (except floor) or dissimilar wall or ceiling; (b) construction changes within the plane of the wall; (c) stucco surfaces exceed 10' in either direction; (d) the area within stucco sections exceeds 100 sq. ft.; (e) as required for brick-veneer construction by the Brick Institute of America especially below ledger angle supports; (f) basic construction contains a control joint; (g) interior partition run exceeds 30'.

Ceiling height door frames may be used as control joints. Less-than-ceiling height frames should have control joints extending to the ceiling from both corners. If control joints are not used, additional reinforcement is required at corners to distribute concentrated stresses.

Sheathing should be broken behind control joints. Where vertical and horizontal joints intersect, the vertical joint should be continuous and the horizontal joint should abut it. Splices, terminals and intersections should be caulked with a sealant.

6. Air and Water Infiltration and Water Permeance—Flashing and sealants as shown in the details should be provided to resist air and water infiltration. All gypsum sheathing must be covered with No. 15 asphalt felt to assure watertight construction. Asphalt felt should be applied horizontally with 2" overlap and attached to sheathing. Accessories for stucco finishes should be made of zinc alloy with weep holes 12" o.c.

7. Corrosive Materials—Zinc alloy accessories are recommended where corrosion due to high humidity and saline content of aggregate is possible. USG Metal Lath, Control Joints and other Metal Accessories, including zinc alloy accessories, should not be used with magnesium oxychloride cement stuccos or portland cement stucco with calcium chloride additives.

8. Prefinished Panels—Ceramic, aggregated or porcelainenameled panels, metal siding and other dry exterior facings weighing up to 8 psf may be applied over gypsum sheathing and screw-attached to studs. Use stainless steel screws, according to siding manufacturer's recommendations. Screws should not transfer more than 15 lb. panel weight per screw to studs. Screw lengths are based on panel thickness plus 7/8".

9. Additional Information—See U.S.G. product folders in this series and in Sweet's General Building File: Gypsum Panels & Accessories Folder SA-927 for information on system components; Texture & Paint Products Folder SA-933 for paint specifications; Gypsum Plasters, Bases & Accessories Folder SA-917 for plaster system components and specifications; Fire Safety Systems Folder SA-707 for data on insulation and mineral fireproofing; Steel Framing Systems Folder SA-510 for fire- and sound-rated systems; FOAMULAR Insulation Folder SA-710 for data on rigid polystyrene insulation.

10. WARNING: COMBUSTIBLE. FOAMULAR Polystyrene Insulation will ignite if exposed to fire of sufficient heat and intensity, although it does contain a flame-retardant additive to inhibit ignition from small fire sources. This product should be installed only with a thermal barrier such as one-half inch thick gypsum board on the interior side of the wall. During shipping, storage, installation and use, this product should not be exposed to open flame or other ignition sources. Use only as directed by specific instructions accompanying the product.

11. High-rise Buildings—Variable wind pressure can cause a structure to drift or sway. This can result in movement of the non-load bearing partitions, thus causing noise. United States Gypsum Company assumes no responsibility for the prevention, cause, or repair of these job-related noises.

12. Vapor Retarders—Where high humidity and temperature conditions predominate, the use and location of a vapor retarder should be determined by a qualified mechanical engineer to prevent moisture condensation within the wall. Vinyl wall coverings not recommended in walls containing vapor retarders.

13. Note—United States Gypsum reserves the right to make improvements in, or change materials and/or configurations of any products in this catalog, without prior notice and without obligation to incorporate the changes or improvements in items already manufactured. Certain framing items are non-standard and available only on special order.

architectural specifications

Part 1: general

1.1 scope—Specify to meet requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured

by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

- a. In cold weather during gypsum panel joint finishing, temperatures within the building shall be maintained within the range of 55° to 70° F (13° to 21° C). Adequate ventilation shall be provided to carry off excess moisture.
- b. When low humidity, high temperatures and rapid drying conditions exist during gypsum base and veneer finish application, DURABOND Joint Compound and PERF-A-TAPE Reinforcement shall be used on all joints and internal corners and allowed to set and dry thoroughly before plaster application.

40SJ20 (4")

60SJ20 (6")

Part 2: products

2.1 materials manufactured by United States Gypsum

a. Studs and Runners-

- USG CWS Studs and CWR Runners
 212CWS (2½") 400 CWS (4")
 358CWS (35%") 600 CWS (6")
 Note: Select CWR Runner to match stud style.
- 2. USG Steel Studs 35SJ22 (3½")

/ (-/-/	, , ,	, , ,
35SJ20 (3½")	40SJ18 (4")	60SJ18 (6")
35SJ18 (3½")	40SJ16 (4")	60SJ16 (6")
35SJ16 (3½")	40SJ14 (4")	60SJ14 (6")
35SJ14 (3½")		
362SJ22 (35/8")	55SJ20 (5½")	
362SJ20 (35/8")	55SJ18 (5½")	
362SJ18 (35/8")	55SJ16 (5½")	
362SJ16 (35/8")	55SJ14 (5½")	
362SJ14 (35/8")		
35CS18 (3½")	40CS18 (4")	
35CS16 (3½")	40CS16 (4")	
35CS14 (3½")	40CS14 (4")	
362CS18 (35/8")	60CS18 (6")	
362CS16 (35/8")	60CS16 (6")	
362CS14 (35/8")	60CS14 (6")	

3. USG Steel Runners

35CR22 (3½") 35CR20 (3½") 35CR18 (3½")	40CR20 (4") 40CR18 (4")	60CR18 (6")
362CR22 (35/8")	55CR20 (5½")	

362CR20 (35/8") 55CR18 (51/2") 362CR18 (35/8")

Note: Select runner to match stud style, except CR18 styles are used with SJ16 and SJ14 studs.

4. USG Steel C-H Studs J-Runners 212CH22 (2½") 212JR24 (2½") 400CH20 (4") 400JR24 (4")

5. USG Metal Furring Channel, for furred interior wall.

b. Sheathing—USG Gypsum Sheathing—½" thick, (2', 4'x8') USG Triple-Sealed Gypsum Sheathing—0.4" thick, (4'x8'), (4'x9'); GYP-LAP Gypsum Sheathing—½" thick, (2'x8'), (4'x8', 9'); USG Gypsum Liner Panels—1" thick, 2' x lengths to 16', (for use with C-H Stud Infill Panel System).

c. Insulation-

1. THERMAFIBER M-S Insulating Blankets—(3") (3%") thick, (16") (24") wide x (48") (96") long or Contractor CW-40

THERMAFIBER Insulation $(1'')(1^{1/2}'')(2'')$ thick, (16'')(24'') wide x 60" long.

- 2. THERMAFIBER Sound Attenuation Blankets—(1½") (2") (3") thick, x (16" x 48") (24" x 48"). (Use where noncombustibility is required. Specify foil-back interior gypsum panels or lath as vapor retarder.)
- **3.** THERMAFIBER Safing Insulation—(2") (4") thick, 24" wide, () long, 4 pcf min. density, (with foil facing) (with galvanized steel impaling clips) (with fire-resistant adhesive).
- 4. FOAMULAR Rigid Polystyrene Insulation—T&G edges (¾") (1") (1½") (2") thick, (24") (48") wide x (8') (9') long.

d. Gypsum Panels-

- 1. Face Boards—Foil-Back SHEETROCK Brand (FIRECODE) Gypsum Panels (½") (5%") thick, 48" wide, lengths as required.
- 2. Backing Boards—Regular SHEETROCK Brand Gypsum Panels (½") (5%") thick, 48" wide, lengths as required (for furred wall construction).

e. Gypsum Base-

- 1. Foil-Back IMPERIAL Gypsum Base (for veneer plasters) ½" thick in Regular and FIRECODE "C", 5%" in Regular, FIRECODE, and FIRECODE C.
- 2. Foil-Back ROCKLATH Plaster Base (for standard plasters) 3/8" thick, (16" x 48") (16" x lengths as required).
- f. Plasters for Interior Surfaces—(specify from Plasters, Bases & Accessories Folder SA-917).
- g. Metal Lath—3.4-lb. USG Galvanized Self-Furring Junior Diamond Mesh Lath 27" x 96".

h. USG Screws-

- 1. (%'')(1/2'') Type (S) (S-12) Pan Head, %'' Type S-12 Low-Profile Head.
- 2. (1") (11/4") (15/8") Type (S) (S-12) Bugle Head.
- 3. 11/4" Type (S) (S-12) Pancake Head.
- 4. (2") (2 $\frac{1}{2}$ ") (3") Type S-12 Wafer Head, for FOAMULAR Insulation.
- i. Lathing Accessories—(specify from Plasters, Bases & Accessories folder SA-917; specify 1" grounds; 1" casing beads not available from U.S.G.).
- j. Exterior Stucco Finish—ORIENTAL Exterior Stucco.
- k. Stucco Lime—BONDCRETE Mason's and Stucco (ASTM C207 Type S) Air Entraining Lime for stucco or masonry.
- 1. Drywall Accessories—(specify from U.S.G. Folder SA-927).
- m. Joint Treatment—(specify from U.S.G. Folder SA-927).
- n. Masonry Lime—MORTASEAL Mason's Lime or BONDCRETE Air Entraining Mason's and Stucco Lime (ASTM C207 Type S).

2.2 materials by other manufacturers

a. Portland Cement-Lime Stucco—Mixed in accordance with ANSI A42.2, Type L. Proportions: scratch coat—1 bag cement:
 ¾ to 1 bag BONDCRETE Lime: 5 to 6 cu. ft. sand; brown coat—1 bag cement: 1 bag lime: 6 to 7 cu. ft. sand; finish coat—1 bag cement: 2 bags lime: 7 to 10 cu. ft. sand.

b. Masonry Materials-

- 1. Masonry Units—Brick, face (ASTM C216) or common (ASTM C62), having a min. compression strength of 2,000 psi tested per ASTM C67. Other units specified by the architect meeting ASTM C126 or approved by authorities having jurisdiction may be used.
- 2. Mortar—Portland cement-lime mortar (Type S, 1:½:4½ mix) (Type N, 1:1:6 mix) (ASTM C270) (Masonry cement mortars shall not be used).
- 3. Brick ties (18-ga. corrugated G-90 galvanized coating) (adjustable wire type) or as specified.
- c. Runner Fasteners—power-driven type with ability to withstand (193) (300) (400)-lb. single shear and (200) (300) (400)-lb. bearing force when driven into structural head or base and without exceeding allowable stress in runner, fastener or structural support.



d. No. 15 Asphalt Felt.

e. Sealants-

- 1. Butyl Tape—1/16" thick, 100% solid polymeric, non-staining, butyl-based sealant tape.
- 2. Other Sealants—(specified by architect).

Part 3: execution

3.1 erection

3.1.1 studs and runners

a. Align runner track accurately according to exterior wall layout and secure to base and head with power-driven fastener spaced
() o.c. Specify from table page 12.

b. Position steel studs vertically in runners and space no greater than (12") (16") (24") (choose spacing from Technical Data tables). Securely anchor each stud to runner with four (\%") (\%") (\%") Type S-12 Pan Head or \%" Type S-12 Low-Profile Head Screws, two at top and two at bottom, with one screw in each flange.

3.1.2 exterior sheathing

Screw-attach USG Gypsum Sheathing, Triple-Sealed Gypsum Sheathing or GYP-LAP Gypsum Sheathing to exterior of each stud with 1" Type(S) (S-12) Cadmium-Plated Screws spaced 3/6" from ends and edges and approx. 8" o.c. Apply sealant around sheathing perimeter at interface with other materials and install flashing as indicated on the drawings. Install asphalt felt horizontally with 2" overlap and 6" endlap and fasten with corrosion-resistant staples as specified. Cut back felt 1/2" on each side of break in supporting members where control joints will be located. When stucco exterior will be applied, sheathing may be tacked in place, since application of self-furring metal lath will complete sheathing anchorage. All sheathing tacked in this manner must be covered with metal lath immediately.

3.1.3 exterior metal lath and accessories

a. Install USG Control Joint No. 100 where indicated on the drawings. Back control joints with 2" wide butyl tape applied to the sheathing. Attach with Bostitch %16" "G" staples or equal, spaced 6" apart on each flange. Break supporting members and sheathing behind control joints. Apply sealant at all splices, intersections and terminals.

b. Apply metal lath with long dimensions across supports, with ends lapped 1" and staggered in adjacent courses, sides lapped ½" and with lath over control joint flanges. Screw-attach self-furring metal lath through sheathing and felt to steel studs spaced 24" o.c. max. and runners with 1¼" Type (S) (S-12) Pancake Head Cadmium-Plated Screws 8" o.c.

c. Apply other lathing accessories per U.S.G Folder SA-917.

3.1.4 C-H studs and runners

a. Position J-Runners at floor and ceiling with short leg toward inside of wall and secure with power-driven fasteners spaced () o.c. Specify from table page 12.

b. Cut Infill Panels 1" less than floor-to-ceiling height. Drive two 8d Duplex nails into bottom of panel, 4" from each edge. Install first panel, position C-H Stud on free end of panel, then continue alternate panel and stud applications to complete wall.

3.1.5 masonry materials

a. Erect per architect's specifications and details.

b. Anchor brick with approved brick ties, screw-attached to each steel stud using two 1¼" Type (S) (S-12) Pancake Head Cadmium-Plated Screws. Anchor other masonry units to each stud in a similar manner, 16" o.c. max. or as recommended by the Brick Institute of America.

c. Support bricks at each floor with steel angles or concrete ledge as approved by architect.

3.1.6 other dry exterior facings

Follow manufacturer's recommendations for application.

3.1.7 insulation

a. Apply 2-ft. wide FOAMULAR Insulation horizontally with tongue edge up, or 4-ft. wide insulation vertically over gypsum sheathing. Fasten panels to studs with Type S-12 Wafer Head Insulation Screws spaced max. 12" o.c. Use 2" length for 1" thick insulation, 2½" length for 1½" insulation, 3" length for 2" insulation. At wall perimeter and terminations, install screws 8" o.c. Cover all framing with panels and fit joints tightly. For fire-rated construction, apply 2-ft. wide FOAMULAR Insulation horizontally with tongue edge up over gypsum sheathing. Fasten 1" panels to studs with 2" Type S-12 Wafer Head Insulation Screws spaced 12" o.c. Cover all gypsum sheathing with panels and fit joints tightly.

b. Insert THERMAFIBER M-S Blankets between studs and staple to the gypsum sheathing using 916" staples with divergent points

the gypsum sheathing using %16" staples with divergent points placed at each corner and in center of each blanket, or friction-fit Contractor CW-40 THERMAFIBER Insulation between steel studs. Install THERMAFIBER Safing Insulation of proper size on (impaling clips) (support brackets) spaced as needed, 24" o.c. max., in safe-off area between curtain walls and floor slabs, leaving no voids.

3.1.8 drywall interior

a. Position Foil-Backed SHEETROCK Brand FIRECODE Gypsum Panels vertically or horizontally and attach to studs with 1" Type S-12 Screws spaced 8" o.c.

b. For furred interior construction, apply regular SHEETROCK Brand Gypsum Panels vertically or horizontally and attach to studs with 1" Type S-12 Screws 8" o.c. Over the first panel layer, apply USG Metal Furring Channels horizontally 24" o.c. and screw-attach through panels into steel studs. Attach each channel attachment flange to each stud with 1" Type S-12 Screws. Screw-attach a second layer of foil-back panels to furring channels with 1" Type S Screws spaced 12" o.c.

c. Install drywall accessories, finish joints, accessories and screw heads per U.S.G. Folder SA-927.

3.1.9 standard lath and plaster interior

a. Apply Foil-Back ROCKLATH Plaster Base face out with long dimension across studs. Butt ends together over studs with joints staggered in successive courses. Attach lath to each steel stud with 1" Type (S) (S-12) Screws spaced 8" o.c. and at least %" from ends and edges.

b. Install lathing accessories and apply gypsum sand basecoat and finish plaster per U.S.G. Folder SA-917.

3.1.10 veneer finish interior

a. Apply Foil-Back IMPERIAL Gypsum Base vertically or horizontally and attach to stud with 1" Type (S)(S-12) Screws 8" o.c.

b. Install lathing accessories and apply IMPERIAL Plaster per U.S.G. Folder SA-917.

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, THERMAFIBER, FIRECODE, SHEETROCK, IMPERIAL, ROCKLATH, RED TOP, PERF-A-TAPE, GYP-LAP, DURABOND, MORTASEAL, ORIENTAL, DIAMOND, BONDCRETE, FOAMULAR is a trademark of UC Industries.

Note: All products described here may not be available in all geographic markets. Consult your local U.S.G sales office or representative for information.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAM-AGES. DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

UNITED STATES GYPSUM

CASTLEGATE® steel-clad thermal entry systems

High energy-saving



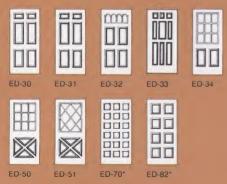
CASTLEGATE flush door styles

for widths: 2'6", 2'8", 2'10", 3'0" and 3'6"



CASTLEGATE embossed door styles

for widths: 2'8" and 3'0'



- 6'8" and 7'0" heights
 24-, 22-, 20- and 18 ga
- Non-standard widths and heights available
- True thermal break
- Adjustable threshold

*Styles available in 3'0" widths only

CASTLEGATE Thermal Entry Door

Classic styles ... steel strong security ... and a remarkable 15 R-factor

Here is the door for today's energy-saving demands and security requirements—detailed in appealing paneled designs. It's the CASTLEGATE Thermal Entry Door, crafted by high technology.

Total insulation inside and out.

Sandwiched between two steel skins is a core of polyurethane proven 50% more thermal effective than polystyrene used in many other entry doors. Around the top and sides, a perimeter weatherstripping shuts out air and water. Below, a bottom sweep, thermal-break edge and adjustable threshold do the same. The result? A 15 R-factor (flush styles) that minimizes energy loss, winter and summer. That's five times better insulating value than solid wood doors.

Paneled beauty sculpted in maintenance-free steel.

The image is that of elegant, handcrafted doors. But this is enduring elegance, crafted from strong, galvanized steel. That means the CASTLEGATE door won't warp, rot, crack, shrink or swell.

All entry doors should be this secure.

Effective security is built into the CASTLEGATE door. Strong steel skins assure powerful surface protection. Hinges are reinforced by heavy steel plates riveted to the door edge. Reinforced lock preparation is provided. And for super entry-security, the CASTLEGATE door can be fitted with a reinforced steel frame and most types of special protective hardware.

Styles, styles, styles.

Traditional or contemporary, glazed or unglazed, embossed or raised profile, there's a CASTLEGATE door to enhance any architectural motif. Choose from 45 basic door styles, 16 sidelight styles and 27 glazing styles. Available in all popular sizes. Tested and passed all major code requirements, including FHA and HUD.

Commercial doors.

Standard CASTLEGATE Thermal Entry Doors meet the most demanding requirements in motels, apartments, offices and other light commercial applications. The full line of systems and sizes offers a 1½ hr. (B) fire rating, and meet all major code requirements. Choice of 24-, 22-, 20- and 18-ga. steel skins.

door/opening dimensions (except replacement doors)

	door dime	ensions (1) (3)	opening dimensions		
	nom. width	actual width	rough opng. width	msnry. opng. width	
single door	2'6"	2'5¾"	2'83/16"	2'101/16"	
widths	2'8"	2'73/4"	2'103/16"	3'01/16"	
	3'0"	2'11¾"	3'23/16"	3'41/16"	
	3'6"	3'5¾"	3'83/16"	3'101/16"	
double door	5'0"	each leaf same	5'27/8"	5'43/4"	
widths	5'4"	as for single door	5'67/8"	5'8¾"	
	6'0"	of half the nominal	6'21/8"	6'4¾"	
	nom. height	actual height	rough opng. height	msnry. (2) opng. height	
door heights	6'8"	6'75/16"	6'10"	6'111/16"	
	7'0"	6'115/16"	7'2"	7'31/16"	

⁽¹⁾ All doors are 13/4" thick. (2) Taken from finish floor.

(3) Non-standard sizes available

Replacement doors.

The CASTLEGATE Thermal Entry Replacement Door provides all the thermal performance, security, great appearance, and long life with minimum maintenance of the standard CASTLEGATE door. It's identical in design and construction, but with slightly smaller dimensions. Furnished prehung in a special steel-shell frame.

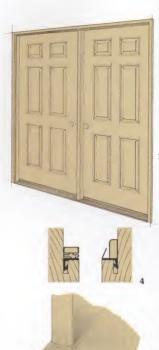
door opening dimensions (replacement doors)

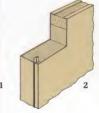
	rough or	enings			
	opening	widths	opening heights		
door size (1)	min.	max.	min.	max.	
2' 6" x 6' 8"	29¾"	301/2"	801/4"	80¾"	
2′ 8″ x 6′ 8″	313/4"	321/8"	801/4"	80¾"	
2' 10" x 6' 8"	333/4"	341/2"	801/4"	80¾"	
3′ 0″ x 6′ 8″	35¾"	361/2"	801/4"	80¾"	
2′ 6″ x 7′ 0″	29¾"	301/2"	841/4"	84¾"	
2′ 8″ x 7′ 0″	313/4"	321/2"	841/4"	84¾"	
2′ 10″ x 7′ 0″	33¾"	341/2"	841/4"	84¾"	
3′ 0″ x 7′ 0″	35¾"	361/2"	841/4"	84¾"	

Fire-rated doors.

Both standard and replacement CASTLEGATE Thermal Entry Doors qualify (in unglazed styles) for a 1½ hr. Class B fire rating with no special construction, no extra cost. Moreover, these doors are available at standard shipping lead times. There is none of the extra paperwork or problems that special orders can cause.

The 1½ hr. Class B rating makes other provisions affecting door application and choice, including one of a fire-rated door frame. Since fire and building codes vary locally, governing code or fire rating requirements should be studied in detail.







Superior features.

1. Steel Skins—galvanized, bonderized steel each side and factory-primed each side for jobsite painting. See Specifications on page 11.

2. Solid Core—polyurethane foam without voids or hollow spots is adhesively bonded to steel skins for high insulating efficiency with exceptional R-factor of 15.

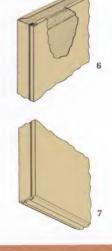
3. Hardware Preparation—standard lock punching: 2%" dia. bore in door face at 2%" or 2%" backset. 1" dia. bolt hole, no cutting of steel required; prepared for hinges. Other preparations upon request.

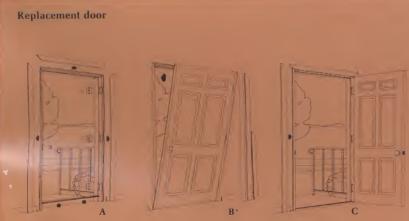
4. Weatherstripping—fully continuous, magnetic around head and strike jamb, compression on hinge jamb, to seal out air and water. Optional: all compression system available.

5. Adjustable Threshold—extruded aluminum sill/threshold, top-adjusting to mate with bottom sweep; raises and lowers without disassembly. Optional: oak system.

6. Thermal Break—vinyl strip locks-in flanged skin edges for maximum strength and rigidity, yet maintains complete skin separation to prevent condensation and heat loss. The strip also provides precision-finish door edge and quality appearance with easy hardware preparation.

7. Bottom Sweep—twin hollow compression tubes and sweepblade of extruded vinyl provide triple contact with threshold to seal out weather.





Easy replacement door installation.

(A) Remove old door, threshold, hinges and lock strike; then, without damaging it, the interior casing trim. Lay the trim and strike aside for reinstallation later.

(B) Insert replacement door, prehung in its shell frame. Fasten it to existing frame.

(C) Install stops provided on head and jambs, then re-apply interior casing trim pieces and paint the door and frame. That's all there is to it!

Once the old door is removed, the existing frame remains without change and the new prehung assembly slips inside. The assembly is then securely anchored with only nails and screws (which are concealed when door is closed and trim replaced). All hardware and an adjustable threshold, which are included, complete the installation—no need to spend hours fitting and hanging a new door.

SPECIAL DOORS

Standard Wood Frame. Supplied with CASTLEGATE Thermal Entry Door when a frame is specified and no special type desired. Available in standard $4^9/_{16}$ ", 5^7 , $5^1/_{9}$ ", $5^1/_{9}$ " jamb width or $6^9/_{16}$ width for energy-efficient houses using 2x6 studs.

Steel Security Frame. Optional, continuous shell section of 22-ga. steel slips over CASTLEGATE Standard Wood Frame after jambs are mortised in usual manner.

Steel Drywall Frame. Optional steel type installed in drywall construction after walls are erected. Available in \(\lambda'' \) increments of jamb width for use in wall thicknesses from 2" to 6\(\lambda'' \). Stocked in most popular jamb widths. Special-ordered in unusual widths with possible upcharge. Door is hung in installed frame at jobsite.

Steel Masonry Frame. Optional steel type installed with masonry construction before wall is erected. Includes wall anchors for masonry, wood-stud or steel-stud walls as specified on order. Door

is hung in installed frame at jobsite.

All CASTLEGATE Steel Frames are correctly sized for a standard CASTLEGATE Thermal Entry Door with top-adjusting threshold. Other thresholds may require cutting back wood frame jambs to accommodate door sweep. Steel frames supplied prime-painted and equipped with compression-type weatherstripping.

drywall frame/opening dimensions

	nom.frame width	rough opening
frame widths	2'6"	2'73%"
	2'8"	2'93/8"
	3′0″	3'13/8"
frame heights	6′8″	6'9¾"
-	7'0"	7'13/4"

good design practices

CASTLEGATE Thermal Entry Doors are supplied with or without frames, designed to adapt easily to common types of both steel and wood. Consult paint manufacturer for finish paint recommendations, with particular regard for compatibility with vinyl weatherstripping. Some paint may react chemically with vinyl, resulting in paint failure.

For information on KEWANEETM Steel Frames, consult Kewanee Folder SA-810 in Sweet's General Building File, Section 8.2, or your Kewanee distributor.

architectural specifications

Part 1: general

- 1.1 scope—Specify to meet project requirements.
- 1.2 delivery and storage of materials—Doors shall be delivered to the contractor at the jobsite. They shall be handled to avoid damage and stored upright in a protected area, covered with tarpaulins or plastic, vented to avoid condensation and entrapped moisture, until ready for installation. Damaged or deteriorated materials shall be removed from the premises.

Part 2: products

2.1 materials

2.1.1 doors—(Flush) (Embossed), solid-core construction, 1¾" thick, completely filled with 2- to 2.5-pcf density foamed polyurethane insulation, enclosed by steel stiles with rigid vinyl thermal break and solid wood rails.

Skins of nom. (24) (22) (20)18)-ga. galvanized steel with flanged returns top and bottom edges, thermal-break lock seam on stiles.

2.1.2 frames

a. Wood Frames— $(4\%_{16}")$ (5%'') (5%'') ($6\%_{16}"$) jamb width, primepainted, with attached weatherstrip—magnetic type on head and strike jamb, compression type on hinge jamb.

b. Steel Frames—for drywall construction, Series (CPF-416, 16-ga.) (CPF-418, 18-ga.) prime cold-rolled steel, with 7-ga. hinge reinforcement, 14-ga. strike reinforcement, prepared for 1½ pr. 4" hinge, 2¾" ANSI A115.3 strike, furnished with adhesive-backed compression-type weatherstrip, supplied KD for field assembly. c. Steel Frames—for masonry construction, Series (CF-416, 16-ga.) (CF-418, 18-ga.) prime cold-rolled steel, with 7-ga. hinge reinforcement, 14-ga. strike reinforcement, prepared for 1½ pr. 4" hinges, 2¾" ANSI A115.3 strike, furnished with adhesive-backed compression-type weatherstrip, supplied (KD for field assembly) (pre-assembled, arc welded and finished smooth).

2.1.3 fire-rated doors and frames—(Flush) (Embossed) solid-core CASTLEGATE Thermal Entry Doors certified for 1½-hr. Class B fire rating per ASTM E152 when equipped with UL-listed locks and used in fire-rated frames.

2.1.4 sidelights—High-quality, precision construction, factory-primed and ready for finish painting, glazed with tempered glass of () type (same as door), with (fixed lights) (ventilating lights, fully-weatherstripped and supplied with aluminum screens).

Part 3: execution

- **3.1 doors**—Hang doors level and plumb, with proper clearances according to manufacturer's printed instructions so that operation is smooth and free of binding.
- **3.2 sidelights**—Install for close, neat fit with doors and frames. Caulk as necessary to seal all openings.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND COSEQUENTAL DAM-AGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to use within thirty (30) days from date it was or reasonably should have been discovered.

CASTLEGATE INDUSTRIES, INC.



castlegate* insulated steel doors

High energy-saving performance and security plus the rich image of handcrafted doors



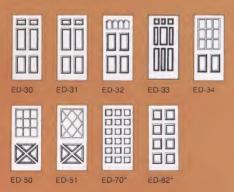
CASTLEGATE flush door styles

for widths: 2'6", 2'8", 2'10", 3'0" and 3'6"



CASTLEGATE embossed door styles

for widths: 2'8" and 3'0'



- 6'8" and 7'0" heights
- 24-, 22-, 20- and 18-ga
- Non-standard widths and heights available
 True thermal break
- Adjustable threshold
- Steel frames

*Styles available in 3'0" widths only.

CASTLEGATE Insulated Steel Door

Classic styles ... steel strong security ... and a remarkable 15 R-factor

Here is the door for today's energy-saving demands and security requirements—detailed in appealing paneled designs. It's the CASTLEGATE Insulated Steel Door, crafted by high technology.

Total insulation inside and out.

Sandwiched between two steel skins is a core of polyurethane—proven 50% more thermal effective than polystyrene used in many other entry doors. Around the top and sides, a perimeter weather-stripping shuts out air and water. Below, a bottom sweep, thermal-break edge and adjustable threshold do the same. The result? A 15 R-factor (flush styles) that minimizes energy loss, winter and summer. That's five times better insulating value than solid wood doors.

Paneled beauty sculpted in maintenance-free steel.

The image is that of elegant, handcrafted doors. But this is enduring elegance, crafted from strong, galvanized steel. That means the CASTLEGATE door won't warp, rot, crack, shrink or swell.

All entry doors should be this secure.

Effective security is built into the CASTLEGATE door. Strong steel skins assure powerful surface protection. Hinges are reinforced by heavy steel plates riveted to the door edge. Reinforced lock preparation is provided. And for super entry-security, the CASTLEGATE door can be fitted with a reinforced steel frame and most types of special protective hardware.

Styles, styles, styles.

Traditional or contemporary, glazed or unglazed, embossed or raised profile, there's a CASTLEGATE door to enhance any architectural motif. Choose from 45 basic door styles, 16 side lite styles and 27 glazing styles. Available in all popular sizes. Tested and passed all major code requirements, including FHA and HUD.

New Textured Stainable Steel Door

The first insulated steel door with natural textured elegance. You can actually feel the texture because it's part of the steel—not a print-on or vinyl-clad pattern that can be scratched off or worn off. Comes with a patented stainable coating ready for staining and protective coating. Easy to stain with any commercially available stain—no need for special applicators or stains. Includes all the advantages of regular CASTLEGATE doors. Wide selection of embossed and flush-door styles.

door/opening dimensions (except replacement doors)

	door dimensions (1) (3)		opening dimensions		
	nom. width	actual width	rough opng, width	msnry. opng. width	
single door widths	2'6"	2'5¾" 2'7¾"	2'8 ³ / ₁₆ " 2'10 ³ / ₁₆ "	2'10 ¹ / ₁₆ " 3'0 ¹ / ₁₆ "	
widths	3'0"	2'113/4"	3'23/16"	3'41/16"	
	3'6"	3'53/4"	3'83/16"	3'101/16"	
double door	5'0"	each leaf same	5'27/8"	5'43/4"	
widths	5'4"	as for single door	5'67/8"	5'8¾"	
	6'0"	of half the nominal	6′2%″	6'4¾"	
	nom. height	actual height	rough opng. height (msnry. 2) opng. height	
door heights	6'8" 7'0"	6'7 ⁵ / ₁₆ " 6'11 ⁵ / ₁₆ "	6′10″ 7′2″	6′11¹/ ₁₆ ″ 7′3¹/ ₁₆ ″	

⁽¹⁾ All doors are 13/4" thick. (2) Taken from finish floor.

(3) Non-standard sizes available

Commercial doors.

Standard CASTLEGATE Insulated Steel Doors meet the most demanding requirements in motels, apartments, offices and other light commercial applications. The full line of systems and sizes offers a 1½ hr. (B) fire rating, and meets all major code requirements. Choice of 24-, 22-, 20- and 18-ga. steel skins.

Replacement doors.

The CASTLEGATE Insulated Steel Replacement Door provides all the thermal performance, security, great appearance, and long life with minimum maintenance of the standard CASTLEGATE door. It's identical in design and construction, but with slightly smaller dimensions. Furnished prehung in a special steel-shell frame.

door opening dimensions (replacement doors)

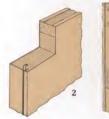
	rough or	enings			
	opening	widths	opening heights		
door size (1)	min.	max.	min.	max.	
2′ 6″ x 6′ 8″	29¾"	301/2"	80"	80¾"	
2′ 8″ x 6′ 8″	31¾"	321/8"	80"	80¾"	
2′ 10″ × 6′ 8″	33¾"	341/2"	80"	80¾"	
3′ 0″ x 6′ 8″	35¾"	361/2"	80"	80¾"	
2′ 6″ x 7′ 0″	29¾"	301/2"	84"	84¾"	
2′ 8″ x 7′ 0″	31¾″	321/2"	84"	84¾"	
2′ 10″ x 7′ 0″	33¾"	341/2"	84"	84¾"	
3′ 0″ x 7′ 0″	35¾"	361/2"	84"	84¾"	

Fire-rated doors.

Both standard and replacement CASTLEGATE Insulated Steel Doors qualify (in unglazed styles) for a 1½ hr. Class B fire rating with no special construction, no extra cost. Moreover, these doors are available at standard shipping lead times. There is none of the extra paperwork or problems that special orders can cause.

The 1½ hr. Class B rating makes other provisions affecting door application and choice, including one of a fire-rated door frama. Since fire and building codes vary locally, governing code or fire rating requirements should be studied in detail.







Superior features.

1. Steel Skins—galvanized, bonderized steel each side and factory-primed each side for jobsite painting. See Specifications on page 11.

2. Solid Core—polyurethane foam without voids or hollow spots is adhesively bonded to steel skins for high insulating efficiency with exceptional R-factor of 15.

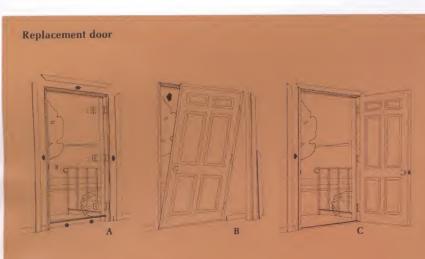
3. Hardware Preparation—standard lock punching: 2½" dia. bore in door face at 2½" or 2¾" backset. 1" dia. bolt hole, no cutting of steel required; prepared for hinges. Other preparations upon request.

4. Weatherstripping—fully continuous, magnetic around head and strike jamb, compression on hinge jamb, to seal out air and water. Optional: all compression system available.

5. Adjustable Threshold—extruded aluminum sill/threshold, top-adjusting to mate with bottom sweep; raises and lowers without disassembly. Optional: oak system.

6. Thermal Break—vinyl strip locks-in flanged skin edges for maximum strength and rigidity, yet maintains complete skin separation to prevent condensation and heat loss. The strip also provides precision-finish door edge and quality appearance with easy hardware preparation.

7. Bottom Sweep—twin hollow compression tubes and sweepblade of extruded vinyl provide triple contact with threshold to seal out weather.



Easy replacement door installation.

(A) Remove old door, threshold, hinges and lock strike; then, without damaging it, the interior casing trim. Lay the trim and strike aside for reinstallation later.

(B) Insert replacement door, prehung in its shell frame. Fasten it to existing frame.

(C) Install stops provided on head and jambs. Then re-apply interior casing trim pieces and paint the door and frame. That's all there is to it!

Once the old door is removed, the existing frame remains without change and the new prehung assembly slips inside. The assembly is then securely anchored with only nails and screws (which are concealed when door is closed and trim replaced). All hardware and an adjustable threshold, which are included, complete the installation—no need to spend hours fitting and hanging a new door.

Standard Wood Frame. Supplied with CASTLEGATE Insulated Steel Door when a frame is specified and no special type desired. Available in standard 49/16", 5", 51/8", 51/4" jamb width or 69/16 width for energy-efficient houses using 2x6 studs.

Steel Security Frame. Optional, continuous shell section of 22-ga. steel slips over CASTLEGATE Standard Wood Frame after jambs are mortised in usual manner.

Steel Drywall Frame. Optional steel type installed in drywall construction after walls are erected. Available in 1/8" increments of jamb width for use in wall thicknesses from 2" to 61/4". Stocked in most popular jamb widths. Special-ordered in unusual widths with possible upcharge. Door is hung in installed frame at jobsite.

Steel Masonry Frame. Optional steel type installed with masonry construction before wall is erected. Includes wall anchors for masonry, wood-stud or steel-stud walls as specified on order. Door is hung in installed frame at jobsite.

All CASTLEGATE Steel Frames are correctly sized for a standard CASTLEGATE Insulated Steel Door with top-adjusting threshold. Other thresholds may require cutting back wood frame jambs to accommodate door sweep. Steel frames supplied prime-painted and equipped with compression-type weatherstripping.

drywall frame/opening dimensions

	nom.frame width	rough opening
frame widths	2'6"	2'73/8"
name widing	2'8"	2'9%"
	3′0″	3′1%″
frame heights	6′8″	6'9¾"
3	7'0"	7'13/4"

good design practices

CASTLEGATE Insulated Steel Doors are supplied with or without frames, designed to adapt easily to common types of both steel and wood. Consult paint manufacturer for finish paint recommendations, with particular regard for compatibility with vinyl weatherstripping. Some paint may react chemically with vinyl, resulting in paint failure.

architectural specifications

Part 1: general

- 1.1 scope—Specify to meet project requirements.
- 1.2 delivery and storage of materials—Doors shall be delivered to the contractor at the jobsite. They shall be handled to avoid damage and stored upright in a protected area, covered with tarpaulins or plastic, vented to avoid condensation and entrapped moisture, until ready for installation. Damaged or deteriorated materials shall be removed from the premises.

Part 2: products

2.1 materials

2.1.1 doors—(Flush) (Embossed), solid-core construction, 13/4" thick, completely filled with 2- to 2.5-pcf density foamed polyurethane insulation, enclosed by steel stiles with rigid vinyl thermal break and solid wood rails.

Skins of nom. (24) (22) (20)18)-ga. galvanized steel with flanged returns top and bottom edges, thermal-break lock seam on stiles. 2.1.2 frames

a. Wood Frames—(4%16'') (5%16'') (5%16'') jamb width, primepainted, with attached weatherstrip-magnetic type on head and strike jamb, compression type on hinge jamb.

b. Steel Frames—for drywall construction, Series (CPF-416, 16-ga.) (CPF-418, 18-ga.) prime cold-rolled steel, with 7-ga. hinge reinforcement, 14-ga. strike reinforcement, prepared for 11/2 pr. 4" hinge, 23/4" ANSI A115.3 strike, furnished with adhesive-backed compression-type weatherstrip, supplied KD for field assembly. c. Steel Frames—for masonry construction, Series (CF-416, 16-ga.) (CF-418, 18-ga.) prime cold-rolled steel, with 7-ga. hinge reinforcement, 14-ga. strike reinforcement, prepared for 11/2 pr. 4" hinges, 23/4" ANSI A115.3 strike, furnished with adhesive-backed compression-type weatherstrip, supplied (KD for field assembly) (pre-assembled, arc welded and finished smooth).

- 2.1.3 fire-rated doors and frames—(Flush) (Embossed) solid-core CASTLEGATE Insulated Steel Doors certified for 11/2-hr. Class B fire rating per ASTM E152 when equipped with UL-listed locks and used in fire-rated frames.
- 2.1.4 sidelights-High-quality, precision construction, factoryprimed and ready for finish painting, glazed with tempered glass of () type (same as door), with (fixed lights) (ventilating lights, fully-weatherstripped and supplied with aluminum screens).

Part 3: execution

- 3.1 doors—Hang doors level and plumb, with proper clearances according to manufacturer's printed instructions so that operation is smooth and free of binding.
- 3.2 sidelights-Install for close, neat fit with doors and frames. Caulk as necessary to seal all openings.

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CASTLEGATE INDUSTRIES, INC.

For more information, call: (312) 321-4000



U.S.G. sound control ceilings

product folder





U.S.G. ceilings: easy to work with, easy to live with. Easily the crowning touch for rooms of distinction.

- balanced sound control performance
- a handsome variety of natural textures
- fire ratings in a wide range of assemblies
- color availability standard
- panels for every function, even mirrored and outdoor
- panels for every budget, even where price is paramount

Whatever your ceiling requirements—sound absorption or attenuation, fire protection, accessibility, compatible color, protected outdoors, even mirror reflection—these U.S.G. sound control products offer ceilings of classic beauty and high performance.

Textures and patterns are varied to suit virtually any room. Prestige ACOUSTONE Tile, Panels and Space Units stress natural textures and standard colors: earthtone, custom and specialeffect. Auratone Panels and Tile feature exceptional value and balanced sound performance; special AURATONE ceiling products include panels with extra abrasion/impact resistance, and extra deep texture, even multi-module design. Shatter-free, sound absorbent VISTA SONIC Mirrored Ceiling Panels offer special benefits for reflective ceilings; and colored-textured USG Gypsum Ceiling Panels provide low-budget beauty for nonacoustical applications.

U.S.G. Sound Control Products components are designed to be complementary in integrated systems. To assure finished appearance and reliable performance, they are sold installed by acoustical contractors on a contract basis. In the product reference (pages 4-5), sound-absorption and light reflectance data are listed for most individual products. Sound attenuation data are given on pages 32-33, details and fire-rating data for all UL Design assemblies on pages 30-31. Physical dimensions and properties, sizes and availability, of Acoustone and Auratone Tile/Panels are shown together by pattern, in those sections.

Cover: Glacier ACOUSTONE Panels in Sandstone earthtone color blend softly with elegant furnishings of this TV studio conference room. Reflective goldtone suspension grid accent adds a contrasting sparkle.

Inside Cover: AURATONE Panels frame Chicago's Magnificent Mile on the office walls of a real estate developer/management firm. Only the noise is missing



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Colors—page 16

Availability—(see specific pattern, or pages 4-5)

Light Reflectance—(see pattern, or pages 4-5)

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Fire & Thermal Data—page 15

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product data (1)/directory						
products & patterns	page	size of tile/panel tested	weight (lb/ft²)	"R" (mean 75°F)	light reflectance ⁽²⁾ (LR Grade)	surface burning characteristics ⁽³⁾
ACOUSTONE Tile	8-11				(color data, p. 9)	
"F" Fissured	10-11	³ / ₄ " x 12" x 12"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15
Plastic-Coated "F" Fissured	7 10-11	³ / ₄ " x 12" x 12"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15
Glacier	8-9	³ / ₄ " x 12" x 12"	1.25 to 1.30	2.12	LR 3 (white)	15/15/0-15
Foil-Backed ACOUSTONE Tile and Panels	8-11				(color data, p. 9)	
"F" Fissured	10-11	3/4" x 12" x 12"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15
		3/4" x 24" x 24"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15
Glacier	8-9	3/4" x 12" x 12"	1.25 to 1.30	2.12	LR 3 (white)	15/15/0-15
		3/4" x 24" x 24"	1.25 to 1.30	2.12	LR 3 (white)	15/15/0-15
Seacrest	10-11	3/4" x 24" x 24"	1.25 to 1.30	2.12	LR 4 (white)	15/15/0-15
Boulder	12-13	3/4" x 24" x24"	1.25 to 1.30	2.12	<.60 (white)	15/15/0-15
ACOUSTONE FIRECODE Tile and Panels	8-11				(color data, p. 9)	
'F" Fissured	10-11	3/4" x 12" x 12"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15
		3/4" x 24" x 24"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15
Glacier	8-9	3/4" x 24" x 24"	1.25 to 1.30	2.12	LR 3 (white)	15/15/0-15
AURATONE Panels	14-26					
Omni Fissured	16-17	5/8" x 24" x 24"	0.81	1.85	LR 1 (white)	25/25/10
		5/8" x 24" x 48"	0.81	1.85	LR 1 (white)	25/25/10
issured	18	5/8" x 24" x 48"	0.81	1.85	LR 1 (white)	25/25/10
		3/4" x 24" x 48"	1.00	2.18	LR 1 (white)	25/25/10
Filigree	19	5/8" x 24" x 48"	0.81	1.85	LR 1 (white)	25/25/10
		3/4" x 24" x48"	1.00	2.18	LR 1 (white)	25/25/10
Pin-Perforated	20	5/8" x 24" x 48"	0.81	1.85	LR 1 (white)	25/25/10
Nordic	21	5/8" x 24" x 48"	0.81	1.85	LR 1 (white)	25/25/10
GLATEX Impact	22-23	5/8" x 24" x 24"	1.20	1.85	LR 1 (white)	25/25/10
		5/8" x 24" x 48"	1.20	1.85	LR 1 (white)	25/25/10
New Horizons Aspen	26	3/4" x 24" x 24"	1.00	2.18	LR 1 (white)	25/25/10
Til		3: " 0 4" 0 4"	1.00	0.40	LD 4 (coleite)	05/05/40

1.00

1-15

1.15

1.15

1.15

1.15

0.90

1.10

0.75

0.90

1.10

0.90

1.10

0.90

0.90

1.15

1.15

1.37

1.15

1.45

1.90

2.18

1.85

1.85

1.85

1.85

1.85

1.85

2.18

1.85

2.18

1.85

2.18

1.85

1.85

1.85

1.85

2.14

1.85

1.85

0.45

not tested

LR 1 (white)

LR 1 (white)(6)

LR 1 (white)

LR 1 (white) (6)

LR 1 (white)

LR 1 (white)

LR 1 (white)

LR 1 (silvered) (7)

LR 1 (white) (8)

25/25/10

25/25/10

25/25/10

25/25/10

25/25/10

25/25/10

25/25/10

25/25/10

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25/25/10

25/25/10

25/25/10

25/25/10

10/10/0

15/0/0(8)

3/4" x 24" x 24"

5/8" x 24" x 48"

5/8" x 12" x 12"

3/4" x 12" x 12"

9/16" x 12" x 12"

5/8" x 12" x 12"

3/4" x 12" x 12"

5/8" x 12" x 12"

3/4" x 12" x 12"

5/8" x 12" x 12"

3/4" x 12" x 12"

5/8" x 12" x 12"

15/16" x 24" x 48"

1/2" x 24" x 48"

14-26

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14-26

16-17

⁽¹⁾Surfaces tested were painted white. All products were tested by recognized independent laboratories (except New Horizons AURATONE Panel sound attenuation and VISTA SONIC Panel sound absorption tests conducted at U.S.G. Research facilities) according to: ASTM C423 for sound absorption, ASTM C523 for light reflectance, AMA 1-II for sound attenuation. Test specimen mounting is coded: (for sound absorption) #1—adhesive application to gypsum board, #2—stapled to wood furring strips, #7—metal suspension system; (for sound attenuation) 1st letter: Ad-Adhesive attachment, C-Continuous at

Tahoe

AURATONE FIRECODE Panels

Omni Fissured

Pin-Perforated

AURATONE Tile

Omni Fissured

Pin-Perforated

Omni Fissured

Fissured

Filigree

AURATONE FIRECODE Tile

VISTA SONIC Mirrored Panels

USG Gypsum Ceiling Panels

Fissured

Filigree

Nordic

Fissured

Filigree

partitions. I—Interrupted at partitions; 2nd letter: C—Concealed suspension system, E—Exposed suspension system; 3rd or 4th letter: F—Flat splines, T—Tee splines, a—one layer 1½" THERMAFIBER Sound Attenuation Blankets laid on ceiling continuous, d—two layers 11/2" THERMAFIBER Sound Attenuation Blankets laid on ceiling, 4 ft. wide on each side of partition.

(2) Federal Specification SS-S-118B classifies Light Reflectance Coefficients into Light

Reflectance Grades designated as follows: LR 1, .75 or greater, LR 2, .70-.74; LR 3, .65-

sound abso	·	coeffic						sound attenuation	
mount-	NRC		enter freque		4000	0000	4000	mount-	STC
ing	range	125	250	500	1000	2000	4000	ing	range
1	.6575	.05	.23	.71	.97	.86	.93	Ad (4)	50-54
7	.7080	.70	.72	.60	.80	.92	.97	ICF, CCF	25-29, 25-29
1	.6575	.22	.21	.78	.99	.78	.59	_	_
7	.7080	.70	.63	.67	.82	.86	.62	_	_
7	.7080	.57	.47	.63	.96	.99	.95	CCF, ICF	20-24, 25-29
7	.6575	.46	.41	.60	.89	.89	1.02	ICF	35-39
7	.6575	.25	.31	.61	.96	.94	.90	IEd ⁽⁵⁾	45-49
7	.7080	.62	.51	.61	.90	.93	.93	CCF	35-39
7	.6575	.29	.28	.54	.98	.97	.91	CE ⁽⁵⁾ , CEd ⁽⁵⁾	35-39, 45-49
7	.6575	.32	.28	.58	.96	.95	.95	CE ⁽⁵⁾	35-39
7	.6575	.36	.33	.59	.90	.96	.95	CE ⁽⁵⁾	35-39
,	.00 .70	.00	.00	.00	.00		.00	01	
7	.7080	.59	.49	.64	.93	.94	.89	CCF	35-39
7	.6070	.34	.26	.56	.92	.87	.93	CE	35-39
7	.6575	.25	.31	.66	.90	.87	.86	CE ⁽⁵⁾	35-39
7	.5060	.31	.31	.49	.70	.70	.71	CE ⁽⁵⁾	35-39
7	.5565	.26	.30	.49	.74	.77	.79	CE	40-44
7	.5565	.24	.33	.53	.83	.74	.66	IE & CE, CEa, CEd	35-39, 40-44, 45-4
7	.5565	.29	.34	.66	.74	.59	.56	CE, CEa	40-44, 45-49
7	.5565	.34	.32	.54	.81	.67	.55	CE	35-39
7	.5565	.32	.34	.67	.75	.59	.55	CE	40-44
7	.5060	.28	.34	.57	.74	.61	.46	CE	35-39
7	.5565	.34	.39	.63	.78	.51	.38	CE	35-39
7	.3545	.25	.26	.33	.45	.50	.50	CE	35-39
7	.3545	.26	.25	.34	.48	.53	.46	CE	40-44
7	.5565	.25	.34	.56	.79	.73	.69	CE ⁽⁵⁾	40-44
7	.5060	.27	.32	.56	.72	.59	.47	CE ⁽⁵⁾	40-44
7	.5565	.18	.30	.54	.84	.73	.63	CE	40-44
7	.5565	.19	.27	.55	.82	.68	.58	IE, CE	40-44, 35-39
7	.5565	.32	.31	.55	.81	.66	.49	CE	40-44
7	.5565	.32	.31	.60	.80	.62	.46	CE	40-44
7	.5060	.30	.28	.50	.79	.69	.46	CE	40-44
7	.5565	.32	.41	.59	.75	.74	.68	CCF	45-49
7	.5060	.36	.36	.61	.64	.57	.53	CCF	45-49
2	.4050	.17	.54	.30	.42	.50	.48		_
7	.5565	.41	.32	.53	.81	.66	.51	CCF	40-44
7	.5565	.40	.34	.60	.79	.64	.53	CCF	45-49
7	.5565	.42	.32	.52	.85	.68	.53	CCF	40-44
7	.5060	.40	.36	.43	.80	.62	.56	CCF	45-49
7	.5060	.39	.33	.52	.76	.65	.49	CCF	40-44
7	.5565	.39	.32	.54	.82	.63	.44		_
7	.5060	.29	.34	.54	.72	.65	.62	CCF	40-44
7	.5565	.41	.33	.53	.82	.67	.62	CCF	40-44
7	.5565	.44	.36	.60	.75	.65	.59	CCF	45-49
7	.5565	.43	.35	.56	.81	.67	.64	CCF	40-44
7	.4555	_	.26	.38	.54	.74	.92	_	

^{.69;} LR 4. .60-.64; less than .60, ungraded. Tests are in accordance with ASTM C523 procedure.

(3) Formerly designated by UL Laboratories Inc. as "fire hazard classification", including in

^{**}Formerly designated by Octaborationes inc. as the hazard classification, including incorder: flame spread, fuel contributed, smoke developed.

**Adhesive attachment of ceiling title to ½" gypsum panels screw-attached to indirect-hung suspension system interrupted at partitions.

**Shadow Line (rabbeted) edge configuration.

⁽⁶⁾LR Grades for four available earthtone colors shown on page 17.

⁽⁷⁾LR Grades for three available reflective tints shown on page 28.

⁽⁸⁾Value shown for white texture-coating, values for available laminated vinyl facings in white and four colors, and unfinished natural paper facing, shown on page 29.



ACOUSTONE Tile and Panels of molded mineral fiber —the premier name in acoustical ceilings, with good reason

- distinctive, highly individual patterns
- efficient sound absorption, effective sound attenuation
- fire ratings to 2-hr., in 4 UL Designs
- wide range of types, sizes, patterns and colors
- custom sizes and colors
- aluminum backing for greater resistance to fire and soiling
- special finish for severe soiling conditions
- precise dimensions and tested performance

ACOUSTONE Tile and Panels set the industry standard for beauty and efficient sound control. Mineral fibers are mixed with a binder and molded into lightweight, natural-textured units, each uniquely patterned. Five earthtone, six "frosted" and six custom-accent color ranges offer excellent design flexibility. Choose just the right color, edge configuration, and concealed or exposed suspension to match duty requirements. Should you be considering "open-plan" office design, ACOUSTONE ceilings perform superbly in numerous installations across the country. Examples of several typical, but varied installations are detailed in U.S.G. folder SC-876, available upon request.

ACOUSTONE ceiling products are ¾-in. thick in 12x12-in. tile, plus 24x24-in. and 24x48-in. panel, sizes. Tile generally come with square or bevel edges, and kerf, for concealed suspension; panels with square or Shadow Line (rabbeted) edges. Standard finish is a washable vinyl coating, factory-applied and heat-cured. An aluminum-foil backing (see below) is standard on ACOUSTONE

Practical non-standard sizes from 24x48-in. or 24x48-in. molds are available at extra cost. Special-service types are also available: ACOUSTONE FIRECODE Tile and Panels for fire-rated requirements, Plastic-Coated finish for problem areas of severe soiling, and Foil-Backed tile and panels.

All types can be cleaned with a damp sponge, dry chemical rubber sponge, or vacuum cleaner; renewed with thinned, nonbridging paint, roll- or spray-applied (TAL Latex or other flat vinyl acrylic).

Closely controlled manufacturing tolerances provide precise dimensions and well-tailored fit. The line has been extensively tested for sound (according to ASTM C423 absorption and AMA 1-II attenuation procedures—see pages 5, 32), and fire performance (with four resulting UL Designs of up to 2 hr.—see pages 30, 31). See page 4 for complete physical property data, the following pages for complete individual pattern availability details.

Special-Service ACOUSTONE Tile/Panels... for fire performance and easy maintenance

ACOUSTONE FIRECODE Tile and Panels—1, 1½ and 2-hr. fire protection when used in UL Designs (see pages 30, 31). No change from regular formulation in textural beauty, high sound absorption and light reflectance. Available, with UL labels, in all patterns except Boulder, all colors except Tierra Brown. Colors may have fire-rating limitations (see your U.S.G. representative).

Plastic-Coated Acoustone Tile and Panels—factory-coated with an additional plastic covering to reduce maintenance where soiling is severe. Available in all Acoustone/Acoustone Firecode Tile and Panels. White only.

Foil-Backed Acoustone Tile and Panels—for improved sound attenuation, resistance to fire, heat loss/gain, and soiling.

limitations

Major changes in humidity noticeably affect acoustical ceiling product dimensions. ACOUSTONE Tile and Panels are sized and designed for use at standard occupancy temperature and humidity (65-85°F, no more than 80% RH). Do not use: (a) where continuously exposed to high humidity, which introduces a possibility of sag; (b) below wainscot height or where exposed to impact, abrasion or tampering. Do not apply Foil-Backed ACOUSTONE Tile with adhesives.

Do not begin installation until residual moisture from plaster, concrete or terrazzo work has dissipated. If ACOUSTONE Tile are installed in a rigid, concealed grid system with humidity higher or lower than that anticipated in service, allow for later dimensional changes. At 85°F and 90% RH, tile may be up to ½ in/ft oversize, and may not fit into a fixed grid. Conversely, tile installed during low humidity may be undersize and will expand when humidity returns to normal.

Do not overlay material, such as insulation, on: (1) ceiling panels where high humidity can occur (it may cause objectionable panel sag), (2) fire-rated Acoustone Firecode ceilings (it nullifies the rating of UL Designs). To prevent objectionable panel sag in cases of standard occupancy conditions, limit such overlaid material to 0.75 lb/ft² maximum.

Other ceiling qualifications required for UL Design fire rating include: (1) a fire-rated suspension system, (2) installation of the entire ceiling assembly as described in specified UL Design.





ACOUSTONE Tile & Panels

pattern shown at approximately 3/4 actual size

Glacier pattern—roughly natural, for visual excitement but quieting sound

Complements contemporary architecture; rough and heavily fissured texture adds a bold accent. The first such acoustical ceiling treatment, this screeded, unplaned finish is a perennial in popularity. Edges are nominally obscured by the pattern's richly etched texture.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Tile: (3/4") 12x12"-SE (Item #701)

Panels: (¾") 2x2', 2x4'—Sq (Items #706, 764), SL (Items #707, 711)

FIRECODE sizes (& thickness)

Tile: (3/4") 12x12"—SE (Item #713)

Panels: (3/4") 2x2'—Sq, SL (Items #714, 715)

Weights

Regular Tile: 1.25 lb/ft² (unbacked), 1.30 lb/ft² (Foil-Backed)

Regular Panels: 1.30 lb/ft2 (all are Foil-Backed)

FIRECODE Tile & Panels: 1.30 lb/ft² (all are Foil-Backed)

Colors (see below)

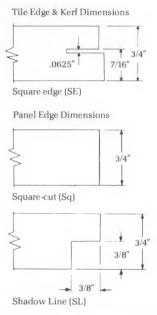
White, earthtones, frosteds, custom

Light Reflectance (see pages 4-5)

White: LR 3 (ASTM C523)

Ivory, Pumice, Clay Gray, Sandstone, Tierra Brown earthtones: unclassified

(coefficients less than .60)



Colors—permanent and clear-through, in standard earthtones and custom brights

Acoustone products offer a big plus in permanence, with color clear through. Through an exclusive process, color is in the base mat itself, not just on the surface. Tile and panels won't expose nicks or scratches as glaring white.

ACOUSTONE Mineral Tile and Panels provide versatile ceiling color in three categories, all at nominal added cost.

Earthtones blend with nearly any furnishings or room decor. Each lends subtle shading to ceilings for truly distinctive interiors. Available standard in: *Ivory, Clay Gray, Pumice, Sandstone* and *Tierra Brown* (latter not available in Acoustone Firecode Tile and Panels).

Frosted colors, available in Glacier pattern only, are factory-applied white over six standard base colors. The result—a hint of tint. A frosted version of each base color is available: Red Frosted, Yellow Frosted, Green Frosted, Blue Frosted, Brown Frosted and Charcoal Frosted.

custom colors for special jobs

For jobs with distinctive design requirements ACOUSTONE Tile and Panels can provide custom color. Factory applied custom colors must approximate one of the base colors within an acceptable range. Base colors are: Red, Yellow, Green, Blue, Brown and Charcoal.

Custom colors are available at additional cost in all patterns of ACOUSTONE Tile and Panels. Subject to limitations in quantity and service. Consult your U.S.G. representative for details.

color-match tolerance

Colors are checked by spectrophotometric analysis according to the widely accepted "L.a.b." chromaticity coordinates system, with a tolerance of .5 maximum (Delta "E"). This value is considered well within normally accepted commercial tolerance for good color

pattern shown at approximately 3/4 actual size

match. Apparent variation in color, however, can result from slight difference in: (1) texture and porosity of the substrate, (2) room lighting, and (3) subjective differences between two observers. To minimize apparent color variations resulting from substrate production differences, all material in one unbroken area of ceiling should be used from the same production lot (indicated by lot number on each carton of material).

Earthtone Colors



These color reproductions show colors as closely as possible within printing limitations. For exact colors, see actual samples of Color ACOUSTONE Tile or Panels offered by your U.S.G. sales representative.



9.1/Una

ACOUSTONE Tile & Panels

pattern shown at approximately 3/4 actual size

"F" Fissured pattern—the clean restraint of classic, understated beauty

Molding, screeding and planing results in a broad range of fissures to echo the natural beauty of travertine marble. These fissure variations assure no two faces exactly alike. A truly non-directional ceiling can be attained when 12x12-in. tile are installed with direction of fissures deliberately random and variation of fissure size/spacing in a full range. Naturalness then is emphasized, and the total ceiling takes on a timeless, monolithic look unmatched by any other product.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Tile: (3/4") 12x12"—SE, BE (Items #101, 102)

Panels: (¾") 2x2', 2x4' — Sq (Items #131, 135), SL (Items #132, 136)

FIRECODE sizes (& thickness)

Tile: (3/4") 12x12"—SE, BE (Items #138, 139)

Panels: (3/4") 2x2'—Sq, SL (Items #140, 141)

Weights

Regular Tile: 1.25 lb/ft² (unbacked), 1.30 lb/ft² (Foil-Backed)

Regular Panels: 1.30 lb/ft2 (all are Foil-Backed)

FIRECODE Tile & Panels: 1.30 lb/ft2 (all are Foil-Backed)

Colors (see page 9)

White, earthtones, custom

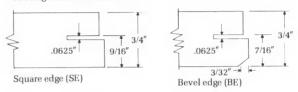
Light Reflectance (see pages 4-5)

White: LR 1 (ASTM C523)

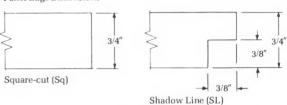
Ivory, Pumice earthtones: LR 3 (estimated)

Clay Gray, Sandstone, Tierra Brown earthtones: unclassified (coefficients less than .60)

Tile Edge & Kerf Dimensions



Panel Edge Dimensions



ACOUSTONE Panels

pattern shown at approximately 3/4 actual size

Seacrest pattern—frothy and soft-formed, as with running surf

Reticulated, nearly non-directional Seacrest pattern brings a unique excitement to ceilings. Panels only, with square-cut or Shadow Line edge configuration for lay-in application.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: $(\frac{3}{4})$ 2x2', 2x4'—Sq (Items #717, 719), SL (Items #718, 765)

FIRECODE sizes (& thickness)

Panels: (¾") 2x2'—Sq, SL (Items #721, 722)

Weights

Regular Panels: 1.30 lb/ft² (all are Foil-Backed) FIRECODE Panels: 1.30 lb/ft² (all are Foil-Backed)

Colors (see page 9)

White, earthtones, custom

Light Reflectance (see pages 4-5)

White: LR 4 (ASTM C523)

Ivory, Pumice, Clay Gray, Sandstone, Tierra Brown earthtones: unclassified (coefficients less than .60)

Panel Edge Dimensions 3/4" Square-cut (Sq) Shadow Line (SL)





ACOUSTONE Panels

pattern shown at approximately 3/4 actual size

Boulder pattern—big and dramatic accent for grand-scale interiors

For a ceiling to match massive-proportioned interiors and roughhewn surfaces. Bold enough to read on very high ceilings. Panel sizes emphasize the magnified scale, Shadow Line (rabbeted) edge mates pattern roughness with suspension grid.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (3/4") 2x2', 2x4'-SL (Items #745, 746)

Weights

Regular Panels: 1.30 lb/ft² (all are Foil-Backed)

Colors (see page 9)

White, earthtones, custom

Light Reflectance (see pages 4-5)

White, Ivory, Pumice, Clay Gray, Sandstone, Tierra Brown earthtones:

unclassified (coefficients less than .60)

Panel Edge Dimensions 3/4' 3/8" Shadow Line (SL)

ACOUSTONE Space Units—

simple concept, beautiful appearance: the simply beautiful way of adding absorption, and controlling reverberation

Uncontrolled reverberations magnify noise and diffuse conversation. ACOUSTONE Space Units, plaques molded of standard ACOUSTONE mineral-fiber material, effectively control reverberation and noise build-up in a wide variety of settings. Space Units can also eliminate "flutter echo", and treat "spot" problem areas in new construction or remodeling. They can be used either as a supplement to other acoustical control, or as primary acoustical treatment.

To absorb sound efficiently, a simple metal-clip mounting exposes all six surfaces. The Space Units can be added in varying numbers and arrangements—to areas of, or entire, walls and/or ceilings according to absorbency needs and prevailing sound frequencies. For complete design information, see U.S.G. data folder SC-823.

Physical Dimensions (nominal)

Regular size (& thickness)

Space Units: (21/4") 101/2x101/2", Sq-Glacier, Finesse (Items #716, #436)

Weight

3 lb/Unit

Color

White

Finish

Washable vinyl coating, factory-applied and heat-cured

Light Reflectance (see pages 4-5)

Finesse pattern: LR 1; Glacier pattern: LR 3 (ASTM C523)

Glacier pattern shown at approximately 3/4 actual size

limitations

Do not use Acoustone Space Units for ceiling or overhead installation where subjected to impact, water immersion, splashing or condensation. They may be used under certain adverse conditions of termperature and humidity (contact your U.S.G. sales representative for acceptability). Rotation limits Unit spacing to a minimum 13 in. o.c. and 7½ in. from any obstruction.

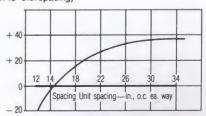
Sound Absorption (ASTM C423 test procedure)

	sabins/unit (1)							
	band center frequency—Hz							
product	125	250	500	1000	2000	4000		
ACOUSTONE Space Units at 15" o.c. ea. way (2)	0.2	0.6	1.4	1.5	1.4	1.3		

(1) One sabin is the absorption equivalent of one square foot of material having an absorption coefficient of 1.00.

(2) Units are clip-mounted, spaced in a regular pattern over a fairly large area of treated wall or ceiling. Other spacings may be used, but Space Unit absorption must be adjusted to chart below.

Space Unit Absorption-Adjustment* (for other than 15" o.c. spacing)



*Absorption change % indicated is based upon frequencies from 500 to 4000 Hz, since the 125- and 250-Hz bands show negligible change (at greater than 15 in. o.c.) and cannot be extrapolated (at less than 15 in. o.c.).



AURATONE Panels and Tile of mineral fiber—provide flexibility, practicality and elegance at an economical price

- balanced and efficient acoustical control, excellent ratings
- fire ratings up to 3 hr., in 13 UL Designs
- surprising value—superb performance and obvious beauty even tile at panel prices
- broad availability—wide choice of sizes, edges, thicknesses;
 special service for fire, abuse, easy maintenance

AURATONE Panels and Tile are the value leader in acoustical ceilings: maximum total performance at minimum cost, and broad, versatile availability. For esthetics, the selection is diverse, with five standard patterns in white—one also in four earthtone colors—plus special-service, deep-texture and "tiled" patterns.

AURATONE ceiling products are a result of carefully controlled formulation of mineral fiber material. Two thicknesses extend the range of sound and fire performance. The standard finish, a washable vinyl coating factory-applied and heat-cured, resists soiling. When necessary, it can be easily cleaned, with a damp sponge, dry chemical rubber sponge or vacuum cleaner. To renew without significant loss of acoustical properties, roll- or spray-paint using a thinned, non-bridging product (TAL Latex or other flat vinyl acrylic). Non-standard sizes of panels and tile can be special-ordered in widths ranging from 12 to 30 in., lengths from 24 to 60 in. Special-service finished for highsoiling and high-abuse areas are described below and on following pages.

AURATONE Panels combine performance and economy with functional versatility. Sizes from 2x2 ft. to 2½x5 ft. go up fast, for minimum installation cost and easy access to above-ceiling utilities. Square or Shadow Line (rabbeted) edge configurations provide flush or recessed-grid apearance. Three special panel types offer: (1) extra resistance to impact and surface abrasion (GLATEX Impact panels, pages 22-23), (2) a tiled look (The Illusion Ceiling Series panels, pages 24-25) and extra deep texture (New Horizons Series panels, page 26).

AURATONE Tile are available in sizes from 12x12 in. to 24x24 in., two edge designs to accommodate concealed spline suspension, and stapled or adhesive attachment. Achieve the look of tile for both standard and fire-rated applications. In five patterns of white.

AURATONE Panels and Tile have been extensively tested for sound (according to ASTM C423 absorption and AMA1-II attenuation procedures—see pages 5, 33), and fire performance (with thirteen UL Designs resulting, of up to 3 hr.—see pages 30-31). See pages 4-5 for physical property and sound absorption data; page 33 for complete sound data. Individual pattern availability details follow.

Special-Service Auratone Panels/Tile...
for extra resistance to fire, soiling, and abnormal abuse

Auratone Firecode Panels and Tile—1, 1½, 2, and 3-hr. fire protection when used in UL Designs (see pages 30-31). Patterns,

colors same as AURATONE Panels and Tile; sound and other physical properties change. UL label service available in all patterns and Omni Fissured colors of standard sizes. UL labels generally are available on non-standard sizes. Colors may have fire-rating limitations (see your U.S.G. representative).

Plastic-Coated Auratone Panels and Tile—factory-coated with an additional plastic covering to reduce maintenance where potential for heavy soiling is great. Available in White only, all Auratone/Auratone Firecode Panels and Tile.

GLATEX AURATIONE Impact Panels—extra resistance to impact and abrasion—see pages 22-23.

limitations

Major changes in humidity noticeably affect acoustical ceiling product dimensions. AURATONE Panels and Tile are sized and designed for use at standard occupancy temperature and humidity (65-85°F, no more than 80% RH). Do not use: (a) where continuously exposed to high humidity, which introduces a possibility of sag; (b) below wainscot height or where exposed to impact, abrasion or tampering.

Do not begin installation until residual moisture from plaster, concrete or terrazzo work has dissipated. If AURATONE Tile are installed in a rigid, concealed grid system with humidity higher or lower than that anticipated in service, allow for later dimensional changes. At 85°F and 90% RH, tile may be up to 1/64 in/ft oversize, and may not fit into a fixed grid. Conversely, tile installed during low humidity may be undersize and will expand when humidity returns to normal.

Do not overlay material, such as insulation, on: (1) ceiling panels where high humidity can occur (it may cause objectionable panel sag), (2) fire-rated AURATONE FIRECODE ceilings (it nullifies the rating of UL Designs). To prevent objectionable panel sag in cases of standard occupancy conditions, limit overlaid material to 0.75 lb/ft² maximum.

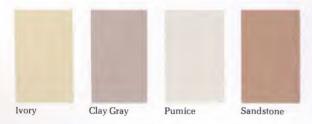
Other ceiling qualifications required for UL Design fire rating include: (1) a fire-rated suspension system, (2) installation of the entire ceiling assembly as described in specified UL Design.

AUR ATONE Panels & Tile

Earthtone colors— muted and surface-coated on Omni Fissured AURATONE Panels and Tile for the finishing touch to any room

Four subtle earthtones blend with the colors and natural materials of contemporary architecture. Economical color for ceilings with plus performance—today's value leader. Available standard in Omni Fissured pattern of Auratone and Auratone Firecode Panels and Tile, all size/edge combinations in: Ivory, Clay Gray, Pumice and Sandstone.

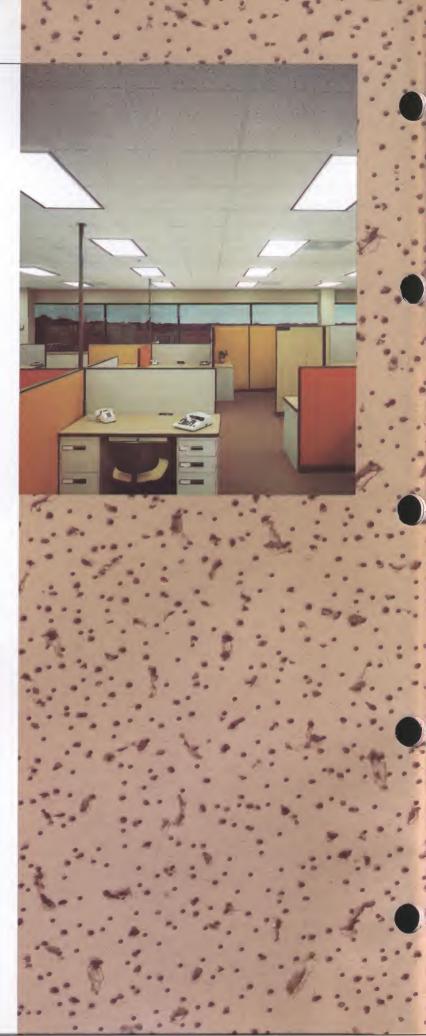
Earthtone Colors (for Omni Fissured pattern)



These color reproductions show colors as closely as possible within printing limitations. For exact colors, see actual samples of Color AURATONE Panels or Tile offered by your U.S.G. sales representative.

Colors are checked by spectrophotometric analysis according to the widely-accepted "L.a.b." chromaticity coordinates system, with a tolerance of .5 maximum (Delta "E"). This value is considered well within normally accepted commercial tolerance for good color match. Apparent variations in color, however, can result from slight difference in: (1) texture and porosity of the substrate, (2) room lighting, and (3) subjective differences between two observers. To minimize apparent color variations resulting from substrate production differences, all material in one unbroken area of ceiling should be used from the same production lot (indicated by lot number on each carton of material).

pattern shown at approximately actual size





pattern shown at approximately actual size



This random combination of non-directional fissures and perforations works hard at controlling sound, is neat and good-looking. The random, "omni-direction" pattern takes on a natural, casual appearance to harmonize with almost any design scheme.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (5%") 2x2', 2x4', 2x5'—Sq (Items #344, 345, 334),

SL (Items #323, 330, 331)

Tile: (5/8") 12x12"—BE (Item #320)

FIRECODE sizes (& thickness)

Panels: (%") 2x2', 2x4'—Sq (Items #338, 339), SL (Items #336, 337)

Tile: $(\frac{5}{8}")$ 12x12"—BE (Item #335)

Weights

Regular Panels: (5/8") 0.81 lb/ft²; (3/4") 1.00 lb/ft²

Regular Tile: (5%") 0.90 lb/ft²; (3¼") 1.10 lb/ft²

FIRECODE Panels & Tile: (5/8") 1.15 lb/ft²; (3/4") 1.37 lb/ft²

Colors (see below)

White, earthtones

Light Reflectance (see pages 4-5)

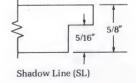
White: LR 1 (ASTM C523)

Ivory, Pumice earthtones: LR 3 (estimated)

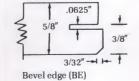
Clay Gray, Sandstone earthtones: unclassified (coefficients less than

Panel Edge Dimensions





Tile Edge & Kerf Dimensions





AURATONE Panels & Tile

Fissured pattern random fissures recalling deep crevasses

The rugged texture of deep, random fissuring blends with most decorating styles—traditional or contemporary; offers functional, efficient sound control.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (5%") 2x2', 2x4'—Sq (Items #560, 563), SL (Items #506, 507)

(3/4") 2×2', 2×4', 2×5'—Sq (Items #359, 361, 362), SL

Tile: (%16") 12x12"—St (Item #500),

(5/8") 12x12"—BE (Item #504), (3/4") 12x12"—BE

FIRECODE sizes (& thickness)

Panels: (5/8") 2x2', 2x4'—Sq (Items #585, 586), SL (Items #517, 518)

(34") 2x2', 2x4', 2½x5'—Sq (Items #387, 388, 363),

SL (Items #312, 313, —)

Tile: (5/8") 12x12"—BE (Item #515)

(¾") 12x12"—BE

Weights

Regular Panels: (5/8") 0.81 lb/ft2; (3/4") 1.00 lb/ft2

Regular Tile: (5%") 0.90 lb/ft2; (34") 1.10 lb/ft2

FIRECODE Panels & Tile: (5/8") 1.15 lb/ft2; (3/4") 1.37 lb/ft2

Colors (see below)

White

Light Reflectance (see pages 4-5)

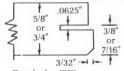
White: LR 1 (ASTM C523)

Panel Edge Dimensions

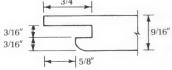


Shadow Line (SL)

Tile Edge & Kerf Dimensions



Bevel edge (BE)



Staple flange edge (St)







pattern shown at approximately actual size



Filigree pattern tailored and formal, appropriate for large, traditional settings

Fine, non-directional fissures give an overall impression of texture to embellish interior design schemes, without introducing a pattern of their own.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (%") 2x2', 2x4'—Sq (Items #564, 567), SL (Items #509, 510) (34") 2x2', 2x4', 2x5'—Sq (Items #367, 369, 370),

—Sq (Items #367, 369, 370) SL (Items #315, 316, —)

Tile: (5%") 12x12"—BE (Item #508)

(¾") 12x12"—BE (Item #307)

FIRECODE sizes (& thickness)

Panels: (%") 2x2", 2x4'—Sq (Items #589, 590), SL (Items #521, 522)

(3/4") 2x2', 2x4'—Sq (Items #389, 390)

Tile: (5/8") 12x12"—BE (Item #508)

(¾") 12x12"—BE (Item #307)

Weights

Regular Panels: (5/8") 0.81 lb/ft2; (3/4") 1.00 lb/ft2

Regular Tile: (5/8") 0.90 lb/ft²; (3/4") 1.10 lb/ft²

FIRECODE Panels & Tile: (5/8") 1.15 lb/ft2; (3/4") 1.37 lb/ft2

Colors (see below)

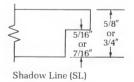
White

Light Reflectance (see pages 4-5)

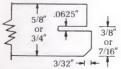
White LR 1 (ASTM C523)

Panel Edge Dimensions





Tile Edge & Kerf Dimensions



Bevel edge (BE)

AURATONE Panels & Tile

Pin-Perforated pattern mixed random medium and small with ordered regularity

The fine and coarse perforations each in random combine into a clean, interwoven texture. Adapts well to any interior design scheme, especially contemporary.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (5%") 2x2', 2x4', 2x5'—Sq (Items #552, 554, 555)

Tile: (5%") 12x12"—BE (Item #501)

FIRECODE sizes (& thickness)

Panels: (5%") 2x2', 2x4'—Sq (Items #581, 582)

Tile: (5/8") 12x12"—BE (Item #514)

Weights

 $\begin{array}{l} \mbox{Regular Panels: (5\%'') 0.81 lb/ft²; (3\'4'') 1.00 lb/ft²} \\ \mbox{Regular Tile: (5\'8'') 0.90 lb/ft²; (3\'4'') 1.10 lb/ft²} \end{array}$

FIRECODE Panels & Tile: (5%") 1.15 lb/ft2; (3/4") 1.37 lb/ft2

Colors (see below)

White

Light Reflectance (see pages 4-5)

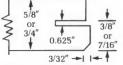
White: LR 1 (ASTM C523)

Panel Edge Dimensions



Square-cut (Sq)

Tile Edge & Kerf Dimensions



Bevel edge (BE)

pattern shown at approximately actual size



U.S.G. sound control ceilings SA-905

pattern shown at approximately actual size

Nordic pattern fine perforations plus texture combine into pebbled surface

This combination of fine perforations and texture creates a pleasing surface appearing pebbled and monolithic, but not at all "acoustical". Make no mistake—it definitely is.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (%") 2x2', 2x4'—Sq (Items #572, 574), SL (Items #523, 524)

Tile: (5%") 12x12"—BE (Item #525)

FIRECODE sizes (& thickness)

Panels: (%") 2x2', 2x4'—Sq (Items #595, 596) Tile: (%") 12x12", 12x24"—BE

Weights

Regular Panels: (5/8") 0.81 lb/ft2; (3/4") 1.00 lb/ft2

Regular Tile: (5/8") 0.90 lb/ft2; (3/4") 1.10 lb/ft2

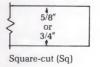
FIRECODE Panels & Tile: (5/8") 1.15 lb/ft2; (3/4") 1.37 lb/ft2

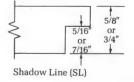
Colors (see below)

Light Reflectance (see pages 4-5)

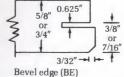
White: LR 1 (ASTM C523)

Panel Edge Dimensions





Tile Edge & Kerf Dimensions





AURATONE Panels

GLATEX Impact Acoustical Panels for ceilings facing a life of scrapes and hard knocks

- scuff-resistant hard-shell surface
- impact-resistant extra-strong core
- panel-positioning clips available
- typical AURATONE Panel balanced acoustical control
- fire-performance formulation optional
- · low cost and fast installation
- pleasing, versatile pattern

GLATEX AURATONE Impact Acoustical Panels are ideal wherever objects—from basketballs to flag poles—are apt to be bumped, knocked, banged or thrown against the ceiling. Locker rooms, handball and racquetball courts, stairways, church basements and meeting rooms are typical. Superior impact- and surface-damage resistance, low cost, plus fast installation, make GLATEX Impact Acoustical Panels a stand-out value.

The GLATEX Panel pattern is a deep, pleasing texture that keeps on looking new, hiding minor scratches, gouges, and scrapes. And GLATEX Panels provide the sound control typical of AURATONE Panels, an optimum balance of absorption and attenuation.

Panels are suspended in any conventional exposed-grid system, providing an impact-resistant acoustical ceiling. Optionally, GLATEX Panels can be secured with Position Control Clips. These spring-type clips flex under impact but return a panel to proper position in the grid when impact might have dislodged it. They still permit plenum access for utility maintenance, although with slightly less ease, and may be desirable in areas of frequent, high impact.

Two key physical properties of GLATEX Panels account for their superior impact performance: (1) greater bending strength to resist breakage, and (2) an extra-tough surface that takes minor scuffs and abrasions in stride. Tested to 20-25 in/lb in a Gardner Impact Text, GLATEX Panels showed virtually no damage. Subjected to the Ball Hardness Test (ASTM C367), which measures ability to resist damage, this extra-hard finish required 225 lb (155 lb for FRECODE Panels) of force on a 2-inch steel ball to depress the panel surface only ¼ inch. This hardness test performance, plus an ability to hide minor damage, was substantially superior to that of all competing products tested. With Position Control Clips in place, 2x2 ft. panels resisted impacts up to 180 in/lb without breakage or displacement from grid.

GLATEX Impact Acoustical Panels are made up of water-felted mineral-wool fibers. The basic Auratone Panel formulation is modified to greater density, providing more strength to resist impact without damage. Panels are available regular, and also available as GLATEX AURATONE FIRECODE Panels for fire-rated requirements. When suspended in qualifying grid systems, the latter type can qualify for certain UL Design ceiling assembly fire ratings of up to 3 hr. No hold-down clips are needed because panels exceed the UL-required minimum weight of 1.00 lb/ft².

Limitations—Major changes in humidity noticeably affect acoustical ceiling product dimensions. Auratone Tile are sized and designed for use at standard occupancy temperature and humidity (65-85°F, no more than 80% RH). Do not use where continuously exposed to high humidity, which introduces a possibility of sag.

Do not begin installation until residual moisture from plaster, concrete or terrazzo work has dissipated. Do not overlay material, such as insulation, on: (1) ceiling panels where high humidity can occur (it may cause objectionable panel sag), (2) fire-rated GLATEX AURATONE FIRECODE ceilings (it nullifies the rating of UL Designs). To prevent objectionable panel sag in cases of standard occupancy conditions, limit such overlaid material to 0.75 lb/ft² maximum.

Other ceiling qualifications required for UL Design fire-ratings include: (1) a fire-rated suspension system, (2) installation of the entire ceilinig assembly as described in specified UL Design.

Physical Dimensions (nominal)

Regular sizes (& thickness)
Panels: (%") 2x2', 2x4'—Sq (Items #625, 626)

FIRECODE sizes (& thickness)
Panels: (%") 2x2', 2x4', 2½x5'—Sq (Items #627, 628)

Weights

Regular Panels: (5%) 1.20 lb/ft² FIRECODE Panels: (5%) 1.22 lb/ft²

Colors (see below)

White

Light Reflectance (see pages 4-5) White: LR 1 (ASTM C523)

Panel Edge Dimensions



Square-cut (Sq)

pattern shown at approximately actual size

AURATONE Panels

The Illusion Ceiling Series for the interest of tile or varied modules, at large-panel price

- tile look at panel price
- versatile design potential
- appearance improvement of problem-size rooms
- non-directional, versatile Omni Fissured pattern
- white and four earthtone colors
- two sizes: 24x48 in., 20x60 in., % in. thick
- standard Auratone and Auratone Firecode Panel performance

The Illusion Ceiling Series of Auratone and Auratone Firecode Panels gives ceilings a monolithic tile look—or the preferred scale of smaller modules—along with the cost/installation/maintenance benefits of large panels. The Illusion Ceiling Series panels provide the same fine sound, fire, light-reflectance and maintenance properties, and earthtone/white color selection, as standard Omni Fissured pattern in both Regular and Firecode types.

These basically are large Omni Fissured AURATONE Panels, facerouted and edge-rabbeted to define smaller modules and permit suspension tees to blend into the plane of the panel face. With tee and panel faces flush, tees of a low-gloss finish become nearly imperceptible. The illusion of tile, smaller panels or strips results, depending upon the variation.

This series of AURATONE Panel patterns gives four distinctly different Illusions: (1) Omni Fissured Eight/12 Tile, (2) Omni Fissured Two/24 panels, (3) Omni Fissured Four/48 Strips, (4) Omni Fissured Three/20 Panels. The latter utilizes a 20x60-in. panel, the others 24x48-in. panels. Each module variation has its own decorative potential for plain or problem rooms, to embellish or correct. Illusion: AURATONE Panel versatility multiplied once more.

Limitations—All limitations of standard Auratone Panels apply—see page 15.

Earthtone Colors (for Omni Fissured Illusion patterns)—see page 16



Panel Dimensions (nominal)

24 × 48 in.

Omni Fissured Eight/12 AURATONE Panel (Item #602)

Omni Fissured Eight/12AURATONE FIRECODE Panel

Eight/12 Tile—for the look of tile at low-cost panel price and accessibility.

24 × 48 in.

Omni Fissured Two/24 AURATONE Panel (Item #600)

Omni Fissured Two/24 AURATONE FIRECODE Panel

Two/24 Panels—large-panel economy and accessibility where a square-



module look is desired.

24 x 48 in.

Omni Fissured Four/48 AURATONE Panel (Item #601) Omni Fissured Four/48 AURATONE FIRECODE Panel

Four/48 Strips—linearity with 6-in. wide strips which can give a short room the illusion of greater length (used longitudinally), a long room greater width (used transversely).



20 x 60 in.

Omni Fissured Three/20 AURATONE Panel (Item #605)
Omni Fissured Three/20 AURATONE FIRECODE Panel

Three/20 Panels—a panel look in the correct scale for small rooms, but with large-panel economy.

Weights

Regular Panels: (5%") 0.81 lb/ft² FIRECODE Panels: (5%") 1.15 lb/ft²

Colors

White, earthtones

Light Reflectance (see pages 4-5)

White: LR 1 (ASTM C523)

Ivory, Pumice earthtones: LR 3 (estimated)

Clay Gray, Sandstone earthtones: unclassified (coefficients less than .60)

pattern shown at approximately actual size



AURATONE Panels

The New Horizons Series— deep natural texture at moderate price

- natural, deep-textured look
- two unique patterns
- balanced sound control of AURATONE Panels
- low cost and fast, panel installation

The New Horizons Series combines the cost and functional advantages of an Auratone Panel with a natural, deeptextured face. These new patterns introduce natural-textured esthetics to Auratone Panel versatility and performance.

Two New Horizons patterns, with textures like relief maps of rough terrain, are available: Aspen and Tahoe. The series comes in one ¾x24x24-in. panel size, Shadow Line (rabbeted) edge configuration.

New Horizons Auratone Panels have excellent performance properties. With White or Sandstone colors to choose from, you can harmonize either Aspen or Tahoe texture with many settings, traditional or contemporary.

Limitations—All limitations of standard Auratone Panels apply—see page 15.

Physical Dimensions (nominal)

Regular size (& thickness) Panels: (¾") 2x2'—SL

Patterns

New Horizons AURATONE Panel—Aspen pattern (Item #650) New Horizons AURATONE Panel—Tahoe pattern (item #630)

Weight

Panels (regular only): (3/4") 1.00 lb/ft2

Colors (see below)

White, Sandstone

Light Reflectance (see pages 4-5)

White: LR 1 (ASTM C523)

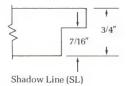
Sandstone earthtone: unclassified (coefficient less than .60)

Earthtone Color (for New Horizons patterns)—see page 16



Sandstone

Panel Edge Dimensions



Aspen pattern shown at approximately actual size



Accessories for Special-Service from ACOUSTONE/AURATONE acoustical ceilings

THERMAFIBER Light Fixture Protection comes conveniently packaged for use with fire-rated ceilings. It consists of 1¼-in. thick semi-rigid mineral-wool board for assembly and suspension over standard-size fixtures. Available UL labels cover ceiling ratings of 1, 1½, 2 and 3 hours. Each package contains board material for one of two types: box assembly, factory-cut for tile ceilings and concealed suspension; tent assembly, field-cut for panels in exposed grids.

Auratone Firecode Panel Light Fixture Protection can be field-fabricated from standard 5%x24x48-in. Auratone Firecode Panels, and qualifies for use in certain fire-rated floor/ceiling assemblies, in lieu of Thermafiber Light Fixture Protection. Included among these assemblies are UL Design Nos. G228, G231, J202 and L206, described on pages 30-31.

THERMAFIBER Sound Attenuation Blankets significantly reduce sound transmission over partitions when they are overlaid on exposed-grid ceilings of ACOUSTONE or AURATONE Panels.

Paperless, semi-rigid mats of spun mineral-fiber, these sound attenuation blankets trap sound energy in millions of air pockets. Laid in one layer over the entire ceiling, or in a double layer only for a 4-ft. distance along each side of a partition, they increase the sound attenuation of acoustical ceilings and greatly improve attenuation of flanking sound over partitions. Thermafiber Sound Attenuation Blankets are 1½x24x48-in.; blanket thermal resistance (R) is 5.75, weight 0.37 lb/ft².

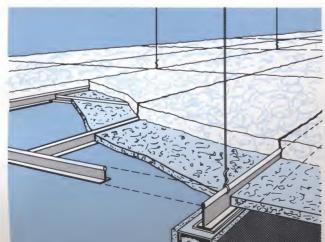
Limitations

Do not overlay insulation on: (1) ceiling panels where high humidity can occur (it may cause objectionable panel sag), (2) firerated ceilings (it nullifies the rating of UL Designs). To prevent objectionable panel sag in cases of standard occupancy conditions, limit overlaid insulation to 0.75 lb/ft² maximum. (For complete limitations of ACOUSTONE and AURATONE ceilings, see pages 7 and 15, respectively.)

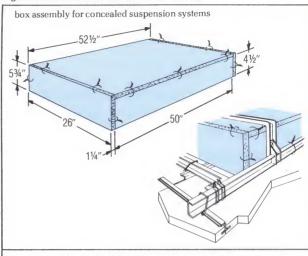
Overlaid Insulation for high-sound attenuation ceilings

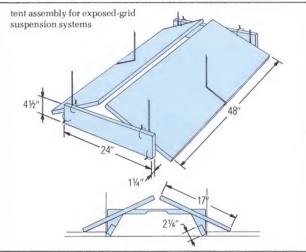
Mounting CEa—STC's in the 40-49 range with 2x4-ft. Fissured AURATONE Panel ceilings (see page 33 for 16-frequency test results).

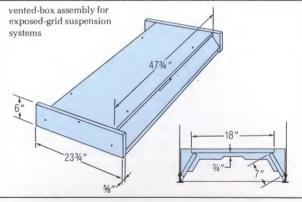
Mounting CEd—STC's in the 45-49 range with 2x2-ft. Glacier ACOUSTONE Panel or 2x4-ft. Fissured AURATONE Panel ceilings (see page 32 for 16-frequency test results).



Light Fixture Protection for fire-rated ceilings









VISTA SONIC Mirrored Acoustical Panels—sophisticated combination of glamor, security and sound-absorbency

- optically clear image-reflecting and sound-absorbing
- lower-cost than glass-mirrored ceilings
- safe and shatter-free
- · easily accessible to utilities above ceiling
- shoplifting-deterring
- · quickly installed, easily cut out for penetrations
- simply cleaned/maintained

VISTA SONIC Mirrored Acoustical Ceiling Panels are a shatterproof, low-cost alternate to mirrored glass. They provide both distortion-free image reflection of mirror quality, and AURATONE Panel sound-absorbency—never before found in reflective ceilings.

These panels create dramatic decorative effects, and heighten visual space perception. Available in silvered, gold-, bronze- or black-reflective tints, they lend interiors transparent color. In shops and stores, they expand the spatial impact of product displays. In allowing store-wide observation, they deter shoplifting and pilfering more effectively than suspended mirrors, less expensively than closed-circuit TV systems, more attractively than either. Increasingly VISTA SONIC Panels pay their way on a security basis.

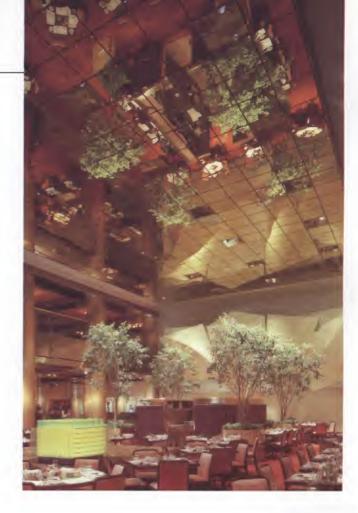
The VISTA SONIC Panel is a 5%-in. thick AURATONE Mineral Acoustical Panel set in a rigid, extruded aluminum frame, with .001-in. thick, aluminized-back-surface polyester film stretched over it. This results in a \$15/16-in\$. thick mirror assembly of optical clarity, of standard 24x24-in. or 24x48-in. nominal size and square edge, for conventional lay-in panel installation in exposed-grid suspension systems. The film is tough and resilient to resist damage, and non-static to minimize dust build-up and need for cleaning. A ½-in. air space behind the film allows it to flex under minor impact without damage, and to maximize sound absorption by the AURATONE Panel behind it. Offers all the advantages of conventional panels in exposed-grid suspension: large, 2x2-ft. or 2x4-ft. sizes; fast installation; easy accessibility for above-ceiling maintenance.

Limitations

Major changes in humidity noticeably affect acoustical ceiling product dimensions. VISTA SONIC Panels are sized and designed for use at standard occupancy temperature and humidity (65-85°F, no more than 80% RH). Do not use: (a) where continuously exposed to high humidity, which introduces a possibility of sag; (b) below wainscot height or where exposed to impact, abrasion or tampering.

Do not begin installation until residual moisture from plaster, concrete or terrazzo work has dissipated. Protect film from damage by sharp edges, abrasion or undue pressure. Cut out holes for penetrations with the special technique developed for this purpose (see U.S.G. data sheet SC-835). Panels cannot be cut down to smaller size.

Do not overlay material, such as insulation, on VISTA SONIC Panels where high humidity can occur (it may cause objectionable panel sag). To prevent sag in cases of standard



occupancy conditons, limit such overlaid material to 0.75 lb/ft² maximum.

Physical Dimensions (nominal)

Regular sizes (& thickness) Panels: (15/16") 2x2', 2x4'

Weight

Regular Panels: 1.45 lb/ft²

Colors

Silvered, Gold-, Bronze- and Black-Reflective

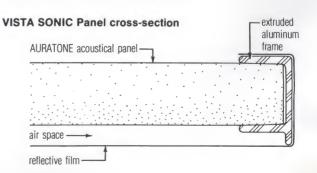
Light Reflectance (see pages 4-5)

Silvered: LR 1 (ASTM C523) Gold-reflective tint: LR 1

Bronze-and Black-reflective tints: unclassified (coefficients less than .60)

Maintenance

Remove slight dents and wrinkles from the film with a hot-air blower of the type used for hair styling—simply direct the airstream at the panel until wrinkles disappear. Cleaning is quickly done with soft polishing cloth and household cleaners—see U.S.G. data sheet SC-835.



USG Gypsum Ceiling Panels the only complete low-cost, non-acoustical line: exterior/interior application, wide color/texture choice, fire ratings, USDA acceptance

- versatile application: indoors, "protected" outdoors, firerated, food service (USDA-accepted)
- good sound attenuation and impact resistance
- extra economy for non-acoustical and unfinished applications
- wide choice of colors, textures and facings—all easily cleaned

USG Gypsum Ceiling Panels are especially made for exposed-grid ceilings where budget and easy maintenance are of prime importance. Highly functional, these lay-in panels offer a range of facings, and types for protected exterior as well as interior applications. Soil-resistant facings and easy cleaning make them ideal for food service areas. FIRECODE "C" core available for fire rating requirements up to 2 hours.

Panels are a noncombustible gypsum core, paper-wrapped and finished with a textured white coating, or laiminated with white or colored vinyl facings. Plain unfinished panels are also available. All panels are square-edged for lay-in with standard exposed-grid suspension systems. The texture-coated type is produced in exterior and interior formulations for economical ceilings and soffits with high light reflectance. The 2-mil vinyl laminated-facing type has excellent flame-resistance properties. The 6-mil type is available in four earthtone colors. Easy washability and good abrasion resistance have earned them USDA acceptance for use in food processing/service areas. Unfinished panels provide rockbottom economy where finish is of secondary importance to budget. Can be field-painted with job-required colors, in the same way as drywall panels.

Limitations

Do not use: (a) in areas where sound absorption is a requirement. (b) where exposure to moisture is extreme or continuous, (c) where directly exposed to weather or water. Provide cross ventilation in unheated or enclosed space above ceiling panels. For exterior applications, the suspension system must be approved by its manufacturer for exterior use.

Do not overlay material, such as insulation, on: (1) ceiling panels where high humidity can occur (it may cause objectionable panel sag), (2) fire-rated USG Gypsum Panel ceilings (it nullifies the rating of UL Designs).

Other ceiling qualifications required for UL Design fire rating include: (1) a fire-rated suspension system, (2) installation of the entire ceiling assembly as described in specified UL Design.

Physical Dimensions (nominal)

Regular sizes (& thickness) Panels: (1/2") 2x2', 2x4'—Sq (Interior) (1/2") 2x2', 2x4'—Sq (Exterior)

FIRECODE sizes (& thickness) Panels: (1/2") 2x2', 2x4'—Sq (Interior) (1/2") 2x2', 2x4'—Sq (Exterior)

Regular Panels: 1.90 lb/ft2 FIRECODE Panels: 1.90 lb/ft2

Colors (see below)

White, Shell, Bone, Adobe, Yellow Essence, natural-paper gray

Light Reflectance (see pages 4-5)

White (texture-coated), Shell, Yellow Essence: LR 1 (ASTM C523) White (2-mil vinyl): LR 2 (ASTM C523)

Bone: LR 3 (ASTM C523)

Adobe: unclassified (coefficients less than .60)

Surface Burning Characteristics (flame spread/fuel contributed/smoke developed)

Texture-coated panels: 15/0/0 6-mil vinyl-faced panels: 40/0/50 2-mil vinyl-faced panels: 10/0/0 Unfinished-paper faced panels: 15/15/0

Unpainted Paper Facing



Shell



These color reproductions show colors as closely as possible within printing limitations For exact colors, see actual USG Gypsum Ceiling Panel facing material samples offered by vour U.S.G. sales representative



UL Designs for fire-rated requirements with:

- AURATONE FIRECODE Tile, 3/4x12x12"
- ACOUSTONE FIRECODE Tile, 3/4x12x12"
- AURATONE FIRECODE Panels, 5/8x24x24", 48"

3- & 2-hr. ratings for steel frame, cellular steel/concrete deck assemblies, with

AURATONE FIRECODE Tile, 3/4x12x12"

A009 3-Hr. (Beam 4-Hr.)

OF

ACOUSTONE FIRECODE Tile, 3/4x12x12"

A010 2-Hr. Restrnd., 11/2-Hr. Unrestrnd. (Beam 11/2-Hr.)

tile suspended on indirect-hung concealed Z-spline system, $2\,1\!/\!2''$ concrete-on-cellular-steel deck.

AURATONE FIRECODE Panels, 5/8x24x48"

A207 3-Hr. (Beam 4-Hr.)

panels suspended in direct-hung exposed-grid, $21\!/\!2''$ concrete-on-cellular-steel deck.

2-hr. rating for prestressed concrete T-beam/deck, with

AURATONE FIRECODE Panels, 5%x24x24" or 48"

J202 2-Hr.

panels suspended in direct-hung exposed-grid.

1½-hr. rating for bar joist/laminated gypsum deck, with

AURATONE FIRECODE Panels, %x24x48"

P228 11/2-Hr.

panels suspended on direct-hung exposed grid hung from bar joists, 2" SPAN-ROCK Laminated Gypsum Plank deck overlaid with $3\frac{1}{2}$ " noncombustible insulation.

1-hr. ratings for wood joists & subfloor, with

ACOUSTONE FIRECODE Tile, $\frac{3}{4}$ x12x12"

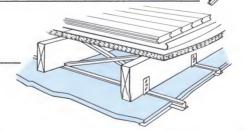
L003 1-Hr.

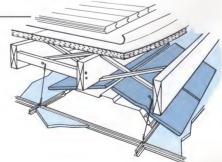
tile suspended on concealed Z-spline system attached to joists.

AURATONE FIRECODE Panels, %x24x24" or 48"

L206 1-Hr.

panels suspended in direct-hung exposed grid, 1" nom. wood floor on 2x10 wood joists. AURATONE FIRECODE-Panel, in lieu of THERMAFIBER, Light Fixture Protection is an option (see p. 27).





• ACOUSTONE FIRECODE Tile. 3/4x12x12"

- AURATONE FIRECODE Tile, 5/8x12x12", 24x24"
- ACOUSTONE FIRECODE Panels, 3/4x24x24"
- AURATONE FIRECODE Panels, 5/8x24x24", 48"; 5/8 or 3/4x20x60", 24x24" to 30x60"
- USG Gypsum Ceiling Panels, 1/2x24x24", 48"

2- & $1\frac{1}{2}$ -hr. ratings for riblath/concrete deck-on-bar joist assemblies, with

ACOUSTONE FIRECODE Tile, 3/4x12x12"

G018 2-Hr., G020 11/2-Hr.

tile suspended on concealed Z-spline system hung from bar joists, $2\frac{1}{2}$ " (G018) or 2" (G020) concrete deck.

AURATONE FIRECODE Tile, 5/8x12x12" or 24x24"

G008 2-Hr. (Beam 2-Hr.)

tile suspended on concealed accessible system hung from bar joists, 2½" concrete deck.

AURATONE FIRECODE Tile, %x12x12"

G019 2-Hr.

tile suspended on concealed Z-spline system hung from bar joists, $2^{1\!/\!2''}$ concrete deck.

ACOUSTONE FIRECODE Panels, 3/4x24x24"

G228 2-Hr. (Beam 2-Hr.)

panels with Shadow Line (rabbeted) edge suspended in direct-hung exposed grid, hung from bar joists, 2½" concrete deck. AURATONE FIRECODE-Panel, in lieu of THERMAFIBER, Light Fixture Protection is an option (see p. 27).

AURATONE FIRECODE Panels, 5/8x24x24" or 48"

G211 2-Hr., G227 2-Hr. (Beam 3-Hr.), G251 2-Hr. (Beam 2-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists, $2\frac{1}{2}$ " concrete deck. G251 excludes x24x24" size. Shadow Line (rabbeted) edge approved for G227.

AURATONE FIRECODE Panels, % or $4\times20\times60''$, $24\times24''$ to $30\times60''$ (except $5\!\!/\!\!\!\!/ \times30\times60''$)

G231 2-Hr. (Beam 3-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists, $2^{1\!/\!2''}$ concrete deck.

USG FIRECODE Gypsum Ceiling Panels, 1/2x24x24"

G222 2-Hr. (Beam 2-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists, 2½" concrete deck.

USG FIRECODE Gypsum Ceiling Panels, 1/2x24x48"

G259 11/2-Hr. (Beam 11/2-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists, $2\frac{1}{2}$ " concrete deck.

11/2- & 1-hr. ratings for steel deck-on-bar joist assemblies, with

AURATONE FIRECODE Panels, %x24x48"

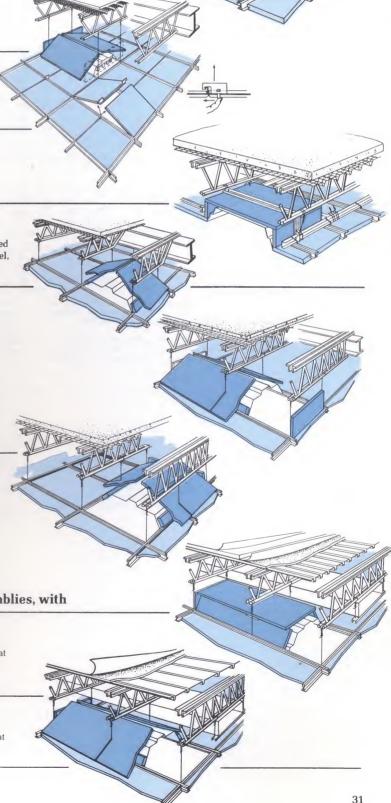
P233 11/2-Hr. (Unrestrnd. 1-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists spaced at 4'0" o.c., 1" steel deck overlaid with 1 layer of gypsum drywall panels and minimum of 1" mineral fiber insulation (no maximum).

AURATONE FIRECODE Panels, %x24x48"

Р214 1-Нг.

panels suspended in direct-hung exposed grid hung from bar joists spaced at 6'0'' o.c., $1\frac{1}{2}''$ steel deck overlaid with 1'' noncombustible insulation.



sound attenuation (1)		
	size of	
	tile/panel	mount-

	size of			sour	nd atte	nuatio	on factors—dB												
products & patterns	tile/panel tested	mount ing	STC	band 125	band center 125 160				400	500	630	800	1000	1250	1600	2000	2500	315	0 400
ACOUSTONE Tile																			
"F" Fissured	³ / ₄ "x12"x12"	Ad(2) ICF CCF	54 27 25	37 24 23	42 30 28	46 31 28	43 23 21	46 23 20	48 22 21	49 23 21	49 23 20	53 24 22	57 25 23	>60 : 27 25	>60 30 26	>60 33 30	>60 34 31	>60 40 34	>60 43 39
Plastic-Coated "F" Fissured	³ / ₄ "x12"x12"	_	_		_	_	_	_	_	_	=	=	_	_	=	_	_	_	_
Glacier	3/4"x12"x12"	CCF ICF	24 25	25 24	28 30	29 29	22 22	19 20	19 20	20 22	20 21	22 22	21 23	24 24	27 27	28 29	29 28	31 32	36 36
Foil-Backed ACOUSTONE Tile and Panels																			
"F" Fissured	³ / ₄ "x12"x12"	ICF	39	30	37	37	32	32	33	34	35	37	38	41	45	50	52	54	58
	3/4"x24"x24"	IEd(3)	45	31	36	36	31	34	36	41	45	48	48	50	55	56	55	57	>60
	¾"x24"x24"	CE(3)	39	28	34	34	31	30	32	34	36	38	38	40	42	44	45	47	50
	3/4"x24"x48"	CE(3)	39	28	34	35	30	29	33	34	36	38	40	41	42	45	44	46	49
Glacier	3/4"x12"x12"	CCF	37	26	33	35	29	28	32	33	33	35	36	38	42	47	48	50	52
	³ / ₄ "x24"x24"	CE(3) CEd(3)	38 45	26 24	34 35	34 34	30 32	29 34	30 38	34 41	36 43	38 47	39 48	40 50	42 50	44 50	44 51	46 55	49 56
Seacrest	3/4"x24"x24"	CE(3)	37	25	31	33	27	28	30	33	35	38	38	39	41	44	42	42	44
Boulder	3/4"x24"x24"	CE(3)	36	24	34	34	28	27	31	34	33	35	37	38	40	41	40	41	43
ACOUSTONE FIRECODE Tile and Panels				-															
"F" Fissured	3/4"x12"x12"	CCF	35	26	35	36	29	27	29	31	31	33	34	36	40	45	45	48	52
	3/4"x24"x24"	CE	36	25	32	32	27	27	29	31	34	35	36	37	40	42	44	44	48
Glacier	3/4"x24"x24"	CE(3)	39	28	35	35	33	29	32	36	36	38	40	41	43	46	46	47	50
VISTA SONIC Mirrored Panels	¹⁵ / ₁₆ "x24"x48"	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
USG Gypsum Ceiling Panels																			
regular (unpainted) FIRECODE (unpainted)	½"x24"x48"	CE	43 45	34 32	40 42	41 42	34 37	36 38	40 44	41	42 45	44	46 48	47 50	48 50	48 49	44 42	41	41 41

(1) All surfaces tested were painted. Sound Transmission Class values were derived by test at recognized independent laboratories according to AMA 1-II procedure. Mounting of ceiling tile/panel test specimens is coded in the table as a two- or three-letter abbreviation for the type of suspension grid.

Abbreviation 1st letter: Ad—Ahbesive attachment, C—Continuous at partitions. I—Interrupted at partitions. 2nd letter: C—Concealed suspension system. E—Exposed suspension system. 3rd or 4th letter: F—Flat splines. T—Tee splines. X—accessible

feature. a—one layer 1½" THERMAFIBER Sound Attenuation Blankets, laid on ceiling continuous. d—two layers 1½" THERMAFIBER Sound Attenuation Blankets laid on ceiling, 4 ft wide on each side of partition.

(2) Tile adhesively attached to ½" gypsum panels screw-attached to indirect hung suspension, and interrupted at partition.

(3) Shadow Line edge configuration.

	size of			sound attenuation factors—dB															
products & patterns	tile/panel tested	mount- ing	STC	band 125	d cente 160	er frequ 200	ency- 250	-Hz 315	400	500	630	800	1000	1250	1600	2000	2500	3150	0 4000
AURATONE Panels																			
Omni Fissured	5/8"x24"x24"	CE	39	26	35	34	28	28	30	34	36	39	42	44	47	50	49	49	49
	5/8"x24"x48"	CE	40	29	38	37	30	30	33	34	37	39	44	49	52	55	55	56	57
Fissured	%"x24"x48"	CE	35	29	34	32	27	26	28	28	31	33	36	40	45	52	53	54	54
		CEa CEd	42 47	30 31	39 39	35 36	30 33	30 35	36 39	40 42	44 46	50 50	56 53	>60 57				>60 >60	>60 >60
	3/4"x24"x48"	CE	41	33	38	37	30	31	33	35	38	41	46	49	54	57	56	57	59
		CEa	46	34	43	40	31	34	39	44	50	55			-	>60		>60	>60
Filigree	5⁄8″x24″x48″	CE	38	28	34	36	30	29	31	32	34	36	40	44	49	56	56	56	57
	3/4"x24"x48"	CE	42	35	37	36	31	31	34	36	39	42	46	50	52	58	57	57	60
Pin-Perforated	5/8"x24"x48"	CE	39	29	37	34	28	28	32	33	35	38	42	46	49	53	52	52	52
	3/4"x24"x48"	CE	42	31	40	39	31	30	34	36	40	44	49	53	56	58	58	58	>60
Nordic	5/8"x24"x48"	CE	35	27	34	33	27	25	28	29	30	32	36	41	46	52	52	54	54
GLATEX Impact	5/8"x24"x24"	CE	36	26	32	35	23	26	32	32	35	36	39	39	41	45	42	40	40
	5/8"x24"x48"	CE	40	29	34	35	28	30	35	35	37	41	41	44	46	48	47	45	46
New Horizons Aspen	3/4"x24"x24"	CE	42	30	30	34	33	32	33	38	39	40	45	51	55	57	57	57	56
Tahoe	3/4"x24"x24"	CE	43	30	31	34	33	32	34	38	39	42	46	51	55	58	57	58	57
AURATONE FIRECODE Panels																			
Omni Fissured	5/8"x24"x48"	CE	41	34	40	38	31	30	33	36	38	40	45	49	52	53	54	54	55
Fissured	5/8"x24"x48"	IE CE	40 40	29 33	36 38	36 37	31 31	29 30	32 33	35 34	37 36	40 40	44 44	47 49	51 51	54 54	54 54	53 54	56 53
Filigree	5/8"x24"x48"	CE	41	32	40	39	32	30	33	35	36	40	43	46	52	54	54	55	56
Pin-Perforated	5/8"x24"x48"	CE	42	33	37	38	32	30	34	37	39	41	47	49	50	55	53	53	56
Nordic	5/8"x24"x48"	CE	41	28	35	34	29	29	33	35	38	41	44	47	49	51	51	51	52
AURATONE Tile																			
Omni Fissured	5/8"x12"x12"	CCF	45	34	38	40	34	35	38	38	42	45	47	52	53	54	55	56	58
	3/4"x12"x12"	CCF	46	34	38	40	34	36	39	41	43	45	50	51	53	54	55	56	56
Fissured	9/16"x12"x12"	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
	5/8"x12"x12"	CCF	44	29	36	39	33	33	37	38	41	43	46	50	52	55	53	54	55
	3/4"x12"x12"	CCF	49	33	41	40	38	38	42	44	45	49	52	54	55	56	55	56	59
Filigree	5/8"x12"x12"	CCF	42	31	33	36	31	33	37	36	39	41	44	48	53	55	55	54	58
	3/4"x12"x12"	CCF	46	32	35	38	34	34	39	40	43	46	50	52	55	57	56	54	58
Pin-Perforated	5/8"x12"x12"	CCF	44	31	34	37	32	33	38	38	41	44	47	50	55	56	56	56	59
Nordic	5⁄8"x12"x12"	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	-
AURATONE FIRECODE Tile																			
Omni Fissured	5/8"x12"x12"	CCF	44	34	38	40	34	34	37	37	41	43	46	50	52	51	54	56	56
Fissured	5/8"x12"x12"	CCF	41	29	34	38	32	32	34	35	37	38	41	46	51	54	55	56	60
	³ / ₄ "x12"x12"	CCF	45	31	41	39	34	33	39	40	40	44	50	53	54	- 54	54	58	60
Filigree	5/8"x12"x12"	CCF	40	30	35	36	30	30	32	34	36	40	41	46	52	55	54	55	60

⁽¹⁾ All surfaces tested were painted. Sound Transmission Class values were derived by test at recognized independent laboratories according to AMA 1-II procedure, except New Horizons Series AURATONE Panels which were tested at U.S.G. Research facilities. Mounting of ceiling tile/panel test specimens is coded in the table as a two-or three-letter abbreviation for the type of suspension grid.

Abbreviation 1st letter: Ad—Adhesive attachment, C—Continuous at partitions. I—Interrupted at partitions. 2nd letter: C—Concealed suspension system. E—Exposed

suspension system. 3rd or 4th letter: F—Flat splines. T—Tee splines. X—accessible feature. a—one layer 11/2" THERMAFIBER Sound Attenuation Blankets, laid on ceiling continuous. d—two layers 11/2" THERMAFIBER Sound Attenuation Blankets laid on ceiling, 4 ft wide on each side of partition.
(2) Not pertinent to page 33.
(3) Shadow Line edge configuration.

good design practices

- 1. System performance—U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.
- 2. Layouts—many acoustical contractors will arrange for job layouts and detailing; however, architects may prefer to furnish the layouts.
- 3. Occupancy conditions—U.S.G. acoustical products are designed for installation and use under standard conditions of temperature and humidity. See "limitations", pages 7, 15, 23, 26, 27, 28 and 29, for detailed use and installation precautions for the respective product lines.
- **4. Insulation**—The roof deck above U.S.G. acoustical ceiling products must be properly insulated and incorporate a vapor barrier to prevent condensation and staining of the ceiling. Insulation blankets can be overlaid on the ceiling, but under some conditions can cause objectionable panel sag—and *always* will if too heavy. And the space above must *always* be adequately ventilated. In addition, overlaid material of *any* kind inhibits access through the ceiling, and usually mullifies an assembly's fire rating (see "limitations" in the specific product section, page 7, 15, 23, 26, 27, 28 or 29).
- 5. Critical lighting —Strong sidelighting with slight angle of incidence to ceiling surface, greatly exaggerates surface irregularities. It demands careful, precise installation to avoid job problems and owner complaints, therefore should be avoided if possible. Effects can be minimized by using beveled-edge or rough-surfaced patterns in lieu of smooth-surfaced or square-edge units, or by employing exposed suspension. Shadows often can be eliminated or softened with draperies or blinds.
- **6. Handling**—Because acoustical ceiling materials are fragile, rough handling can easily chip edges or break units. Cartons never should be used as scaffolding or a substitute for a ladder.
- 7. Concealed spline systems—They present the most nearly monolithic ceiling appearance. Four-sided spline support levels the tile, acts as an air seal. These systems provide slight adjustment to compensate for job inaccuracies. They can provide accessibility above, but square-edge tile is not recommended for frequent removal.
- **8. Humidity variation**—Between installation and use of tile on rigid concealed-grid suspension systems, humidity can cause expansion-contraction problems with the tile. See "limitations", pages 7 and 15 for detailed precautions for the respective product lines.
- 9. Exposed grid systems—With lay-in panels, these provide access above the ceiling, and a choice of surface treatment with various edge configurations; square edge for flush installation or Shadow Line for recessed-grid effect. In exterior or fire-rated applications, only suspension systems so rated may be used.
- 10. Maintenance—general cleaning, for loose dust, is handled with a soft brush or vacuum cleaner. Brushing should be light and in only one direction. Small marks and smudges can usually be removed with "art gum" eraser. New wallpaper cleaner is often used

for larger soiled areas. For small nicks and chips a small amount of paint, chalk or pastel of matching color is excellent for hiding and "filling." For the white color, typists' correction fluid, or shoe polish is satisfactory. A trial should be made on a scrap tile.

Soiled acoustical tile and panels can be washed with mild soapsuds, but not detergent, and should never be soaked or immersed. A soft washcloth, soaked and wrung dry is best, both for washing lightly and for clear-water rinse. Tile adhesively applied should not be washed until 4 hours later.

Ceiling units can be repainted without loss of acoustical properties if a thin, non-bridging, vinyl-acrylic flat wall paint is used (such as TAL Latex Wall Paint from U.S.G.). Plastic-coated tile/panels should be repainted with TAL Latex, or other properly formulated vinyl-acrylic semi-gloss enamel to retain the original semi-gloss appearance. Paint should be chosen also for good hiding power. Spraying is preferable, but Acoustone products and USG Gypsum Ceiling Panels also can be brush- or roller-painted. If possible, units should be removed from ceiling for painting. 11. Dimensions—Product standards are based upon performance ratings, not dimensional minimums. In accordance with industry practice, all acoustical ceiling product dimensions are nominal. 12. Color/texture uniformity—Variations in color and fissure size in acoustical ceiling products are natural; they are of small consequence within a batch, but more obvious from batch-to-batch. Jobs should be planned so that material is ordered and shipped at one time

architectural specifications

Part 1: general

1.1 scope—Specify areas to receive this acoustical treatment.

1.2 qualifications

Construction conditions shall comply with ASTM C636. Acoustical material and suspension systems, including all necessary hangers, grillage, splines and supporting hardware, shall be furnished and installed by an acoustical contractor.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises. Immediately prior to installation, tile and panels shall be stored for a sufficient time to stabilize at temperature and humidity conditions ambient during installation, and anticipated for occupancy.

1.4 environmental conditions

Installation of (acoustical tile or panels shall not begin until building is enclosed, permanent heating and cooling equipment in operation, and residual moisture from plaster, concrete or terrazzo work dissipated.) (USG Exterior Gypsum Panels shall not begin until protection from direct exposure to water and weather has been provided.)

1.5 design conditions

System shall be rated NRC () in accordance with ASTM C423 and STC () in accordance with AMA 1-II as tested by an independent agency.

Part 2: products

2.1 materials

- **2.1.1 ACOUSTONE Mineral Acoustical Tile** by United States Gypsum, ("F" Fissured) (Glacier) (Seacrest) (Boulder) pattern, () color, ¾" thick, (length x width), (bevel) (square) edge, molded mineral fiber units having natural fissured surface, 18 lb/ft³ min. density, with (non-breathing factory-applied aluminum foil backing,) (factory-applied plastic surface coating).
- 2.1.2 Foil-Backed Acoustone (FIRECODE) Mineral Acoustical (Tile) (Panels) by United States Gypsum, (approved for UL Design No. []), () pattern, () color, ¾" thick, (12"x12") (24"x24"), (square) (bevel) (Shadow Line) edge, with factory-applied non-breathing aluminum foil backing, 18 lb/ft³ min. density, (and factory-applied plastic surface coating).
- 2.1.3 ACOUSTONE Mineral Acoustical Space Units by United States Gypsum, (Finesse) (Glacier) pattern, white color, $2\frac{1}{4}$ " thick, $10\frac{1}{2}$ " x10½", 18 lb/ft³ min. density.
- **2.1.4 AURATONE Acoustical Tile** by United States Gypsum, (Omni Fissured) (Fissured) (Filigree) (Pin-Perforated) (Nordic) pattern, () color, (%16") (5%") (3%") thick, (length x width), (staple flange) (butt bevel) (bevel with kerf) (24"x24" Shadow Line) edge, mineral fiber ceiling tile, (factory-applied plastic surface coating).
- **2.1.5 AURATONE Acoustical Panels** by United States Gypsum, (Omni Fissured) (Fissured) (Filigree) (Pin-Perforated) (Nordic) pattern, () color, (%") (34") thick, (length x width), mineral fiber ceiling panels, (factory-applied plastic surface coating).
- 2.1.6 GLATEX AURATONE (FIRECODE) Impact Acoustical Ceiling Panels by United States Gypsum, mineral fiber of (23.0) (23.4) lb/ft³ density, Gardner Impact-Tested to 20-25 in-lb without visible damage, Ball Hardness Tested (ASTM C367) to (225) (155) lb for ¼-in. depression by a 2-in. steel ball, (approved for UL Design No. [],) White color, ¾ in. thick, (24x24") (24x48"), square edge (, factory-applied plastic surface coating) (; Position Control Clips attached to suspension grid, 2 retaining each panel).
- 2.1.7 Auratone (Firecode) Illusion Ceiling Series Acoustical Panels by United States Gypsum, (approved for UL Design No. []), Omni Fissured perforation pattern with edge rabbeted and face routed to (Eight/12 Omni Fissured pattern, 24x48" panel size) (Two/24 Omni Fissured pattern, 24x48" panel size) (Four/48 Omni Fissured pattern, 24x48" panel size) (Three/20 Omni Fissured pattern, 20x60" panel size), 5%" thick, () color, mineral fiber ceiling panels, (, factory-applied plastic surface coating).
- **2.1.8 AURATONE New Horizons Series Ceiling Panels**, by United States Gypsum, (Aspen) (Tahoe) pattern, (White) (Sandstone) color, %" thick, 24x24", Shadow Line edge (, factory-applied plastic surface coating).
- **2.1.9 AURATONE FIRECODE Acoustical Tile** by United States Gypsum, approved for UL Design No. (), (Omni Fissured) (Fissured) (Filigree) (Pin-Perforated) (Nordic) pattern, () color, (%") (3/4") thick, (12"x12") (12"x24") (24"x24"), (bevel) (square) edge, (factory-applied plastic surface coating).
- **2.1.10** AURATONE FIRECODE Acoustical Panels by United States Gypsum, approved for UL Design No. (), (Omni Fissured) (Fissured) (Filigree) (Pin-Perforated) (Nordic) pattern, () color, %" thick, (length) x width), (factory-applied plastic surface coating).
- **2.1.11 VISTA SONIC Mirrored Ceiling Panels** by United States Gypsum, ¹⁵/₁₆" thick, (24"x24") (24"x48"), tinted (silver) (gold) (bronze) (black)-reflective.

- 2.1.12 USG (FIRECODE) Interior Gypsum Ceiling Panels by United States Gypsum, [approved for UL Design No. (G222) (G259)] [(unpainted) (texture-painted () pattern)] [faced with vinyl, (2-mil) (6-mil) thickness, () color, () pattern], nom. ½" thick, (24"x24") (24"x28").
- **2.1.13 USG (FIRECODE) Exterior Gypsum Ceiling Panels** by United States Gypsum (unpainted) (texture-painted [] pattern) (faced with vinyl, [2-mil] [6-mil] thickness, [] color, [] pattern), nom. ½" thick, (24"x24") (24"x48").
- **2.1.14 THERMAFIBER Light Fixture Protection** by United States Gypsum, approved for UL Design No. (), (box), (tent) type assembly, nom. 1¹/₄" thick, semi-rigid mineral fiber board.
- **2.1.15 Auratone Light Fixture Protection** by United States Gypsum, field-fabricated to UL Design requirements from standard Auratone Firecode Panels, 5%"x2'x4' size.
- 2.1.16 fire-rated suspension—Per UL Design No. () and ASTM C635
- **2.1.17 concealed suspension**—commercially available system meeting ASTM C635. Flat metal splines engage adjacent tile.
- 2.1.18 one-way exposed spline suspension (48")—Commercially available suspension system meeting "intermediate" (or better) structural standards of ASTM C635, having main member exposed, supporting acoustical tile on all four sides using appropriate angle or tee splines between adjacent tile.
- 2.1.19 exposed grid (Shadow Line) suspension—Inverted tee, direct hung system meeting "intermediate" (or better) structural standards of ASTM C635.
- **2.1.20** concealed accessible (shiplap) suspension—1¹/₄" Z-runner spaced 24" o.c., attached to 1¹/₂" channel grillage. Back-to-back angle splines engage adjacent tile to provide () % accessibility to plenum. Tee and angle splines support remaining tile.

Part 3: execution

- **3.1 suspension system**—Install acoustical material and suspension system, including necessary hangers, grillage, splines and other supporting hardware, in accordance with UL Design No. () and ASTM C636.
- **3.2 adhesive**—Apply acoustical material, using an adhesive manufactured specifically for applying acoustical tile, in accordance with adhesive manufacturer's directions. Insert fiber splines in kerfs at corners of units.
- **3.3 "F" Fissured Acoustone Tile**—Intermix tile from four or more cartons to obtain uniform distribution of fissure variations.
- **3.4** ACOUSTONE **Space Units**—Install Space Units with Spin-on Wall Clip attached with suitable fasteners to wall.
- 3.5 The Illusion Ceiling Series exposed-grid suspension—
 Inverted tee, exposed surfaces having low-gloss finish and color of
 The Illusion Ceiling Series (AURATONE) (AURATONE FIRECODE) Panels,
 direct-hung system meeting "intermediate" (or better) structural
 standards of ASTM C635.
- $\bf 3.6$ fire-rated suspension ${\rm Per}$ UL Design No. () and ASTM C635.
- **3.7 light fixture protection**—Install (THERMAFIBER) (AURATONE) Light Fixture Protection, and necessary hangers and ties, in accordance with UL Design No. () and ASTM C635.



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ACOUSTICAL TREATMENT

UNITED STATES GYPSUM

product folder





U.S.G. ceilings: easy to work with, easy to live with. Easily the crowning touch for rooms of distinction.

- balanced sound control performance
- a handsome variety of natural textures
- fire ratings in a wide range of assemblies
- wide-range color availability standard
- panels for every function, even mirrored and outdoor
- panels for every budget, even where price is paramount

Whatever your requirements—sound absorption or attenuation, fire protection, accessibility, compatible color, high humidity, macro scale, protected outdoors, even mirror reflection—these U.S.G. sound control products offer ceilings of classic beauty and high performance.

Textures, patterns and sizes are varied to suit virtually any room, on a scale from intimate to monumental, in a style from classical to contemporary. Prestige Acoustone Tile, Panels and Space Units stress natural textures and fifteen new standard colors, earthtone and special-effect. Auratone Panels and Tile feature exceptional value and balanced sound performance. Special Auratone Panels offer extra abrasion/impact resistance, extra high-humidity sag resistance and extra-deep texture, macro-scale size, or even multi-module design. Shatter-free, sound absorbent VISTA SONIC Mirrored Ceiling Panels offer special benefits of reflective ceilings clear or tinted. Coloredtextured USG Gypsum Ceiling Panels provide low-budget beauty for non-acoustical applications.

U.S.G. Sound Control Products components are designed to be complementary in integrated systems. To assure finished appearance and reliable performance, they are sold installed by acoustical contractors on a contract basis. In the product summary on pages 4-5, sound absorption test data are shown complete, and key physical properties are highlighted as a quick reference: size tested, weight, thermal resistance, light reflectance, surface burning characteristics and NRC/STC ranges. Detailed physical properties and availability of specific product configurations in both ACOUSTONE and AURATONE product lines are shown in those sections according to pattern and special panel types. Sound attenuation test data are given on page 30, fire-rating data and details for all UL Design assemblies on pages 32-33.

Cover: "F" Fissured ACOUSTONE Tile accent the spacious simplicity of this hotel lobby. The Sandstone ceiling color helps to unify the design.

Inside Cover: A cosmetics company puts on its best face with elegant glitter. VISTA SONIC Mirrored Ceiling Panels reflect the image of good taste.

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products & patterns	page	size of tile/panel tested	weight (lb/ft²)	"R" (mean 75°F)	light reflectance ⁽²⁾ (LR Grade)	surface burning characteristics ⁽³⁾	
ACOUSTONE Tile	8-11		agantina di samangan dan disa disa di kangan di kangan di samata da sa di sana sa sama sa sa sa sa sa sa sa sa	en e	(color data, p. 9)		
"F" Fissured	10-11	3/4" x 12" x 12"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15	
Plastic-Coated "F" Fissured	7 10-11	3⁄4" x 12" x 12"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15	
Glacier	8-9	3/4" x 12" x 12"	1.25 to 1.30	2.12	LR 3 (white)	15/15/0-15	
Foil-Backed ACOUSTONE Tile and Panels	8-11				(color data, p. 9)		
"F" Fissured	10-11	³ / ₄ " x 12" x 12"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15	
		³ / ₄ " x 24" x 24"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15	
Glacier	8-9	3/4" x 12" x 12"	1.25 to 1.30	2.12	LR 3 (white)	15/15/0-15	
		3/4" x 24" x 24"	1.25 to 1.30	2.12	LR 3 (white)	15/15/0-15	
Seacrest	10-11	3/4" x 24" x 24"	1.25 to 1.30	2.12	LR 4 (white)	15/15/0-15	
Boulder	12-13	³ / ₄ " x 24" x24"	1.25 to 1.30	2.12	<.60 (white)	15/15/0-15	
ACOUSTONE FIRECODE Tile and Panels	8-11	2/" 10" 10"	1051 100	0.10	(color data, p. 9)	15/15/0.15	
"F" Fissured	10-11	3/4" x 12" x 12"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15	
Olasia	0.0	3/4" x 24" x 24"	1.25 to 1.30	2.12	LR 1 (white)	15/15/0-15	
Glacier	8-9	³ / ₄ " x 24" x 24"	1.25 to 1.30	2.12	LR 3 (white)	15/15/0-15	-
AURATONE Panels Fissured	14-27	5/8" x 24" x 48"	0.81	1.85	(color data, p. 17, 24, LR 1 (white)	25/25/10	
11330160	10	³ / ₄ " x 24" x 48"	1.00	2.18	LR 1 (white)	25/25/10	
Omni Fissured	17	5/8" x 24" x 24"	0.81	1.85	LR 1 (white) ⁽⁶⁾	25/25/10	
Offini Floodied	17	5%" x 24" x 48"	0.81	1.85	LR 1 (white) ⁽⁶⁾	25/25/10	
Pin-Perforated	18	5%" x 24" x 48"	0.81	1.85	LR 1 (white)	25/25/10	
Micro-Perforated	21	3/4" x 24" x 48"	1.00	2.18	LR 1 (white)	25/25/10	
Nordic	19	5%" x 24" x 48"	0.81	1.85	LR 1 (white)	25/25/10	
Filigree	20	5%" x 24" x 48"	0.81	1.85	LR 1 (white)	25/25/10	
		3/4" x 24" x 48"	1.00	2.18	LR 1 (white)	25/25/10	
Super-E	21	5/8" x 24" x 48"	0.90	1.85	LR 1 (white)	25/25/10	
GLATEX Impact	22-23	5%" x 24" x 24"	1.20	1.85	LR 1 (white)	25/25/10	
		5/8" x 24" x 48"	1.20	1.85	LR 1 (white)	25/25/10	
New Horizons Aspen	24-25	3/4" x 24" x 24"	1.00	2.18	LR 1 (white)(6)	25/25/10	
Tahoe		3/4" x 24" x 24"	1.00	2.18	LR 1 (white)(6)	25/25/10	
The Illusion Eight/12 (Omni Fissured)	26-27	5/8" x 24" x 48"	0.81	1.85	LR 1 (white)(6)	25/25/10	
Ceiling Series Two/24		5/8" x 24" x 48"	0.81	1.85	LR 1 (white)(6)	25/25/10	
AURATONE FIRECODE Panels	14-27				(color data, p. 17, 24,	26)	
Fissured	16	5/8" x 24" x 48"	1.15	1.85	LR 1 (white)	25/25/10	
Omni Fissured	17	5/8" x 24" x 48"	1.15	1.85	LR 1 (white)(6)	25/25/10	
Pin-Perforated	18	5/8" x 24" x 48"	1.15	1.85	LR 1 (white)	25/25/10	
Nordic	19	5/8" x 24" x 48"	1.15	1.85	LR 1 (white)	25/25/10	
Filigree	20	5/8" x 24" x 48"	1.15	1.85	LR 1 (white)	25/25/10	
AURATONE Tile	14-27				(color data, p. 17)		
Fissured	16	⁹ / ₁₆ " x 12" x 12"	0.75	not tested	LR 1 (white)	25/25/10	
		5/8" x 12" x 12"	0.90	1.85	LR 1 (white)	25/25/10	
		3/4" x 12" x 12"	1.10	2.18	LR 1 (white)	25/25/10	
Omni Fissured	17	5/8" x 12" x 12"	0.90	1.85	LR 1 (white) ⁽⁶⁾	25/25/10	
B: B / · · ·		3/4" x 12" x 12"	1.10	2.18	LR 1 (white)(6)	25/25/10	
Pin-Perforated	18	5/8" x 12" x 12"	0.90	1.85	LR 1 (white)	25/25/10	
Nordic	19	5%" x 12" x 12"	0.90	1.85	LR 1 (white)	25/25/10	
Filigree	20	5/8" x 12" x 12"	0.90	1.85	LR 1 (white)	25/25/10	
AUDATONIC CIDEOODE TIL	44.07	3/4" x 12" x 12"	1.10	2.18	LR 1 (white)	25/25/10	
AURATONE FIRECODE Tile	14-27	56" v 10" v 10"	1.15	1.05	(color data, p. 17)	25/25/10	
Fissured	16	5/8" x 12" x 12"	1.15	1.85	LR 1 (white)	25/25/10	
Omni Fissured	17	34" x 12" x 12" 5%" x 12" x 12"	1.37	2.14	LR 1 (white) LR 1 (white) ⁽⁶⁾	25/25/10 25/25/10	
			1.15	1.85		25/25/10	
Filigree VISTA SONIC Mirrored Panels	20	5%" x 12" x 12" 15/16" x 24" x 48"	1.15	1.85	LR 1 (white) LR 1 (silvered) (7)	10/10/0	
USG Gypsum Ceiling Panels	29	½" x 24" x 48"	1.45	0.45	LR 1 (white) (8)	15/0/0(8)	-
		/L // LT // TO		5.75	Li i (winto)	10,0,0	

⁽¹⁾Surfaces tested were painted white. All products were tested by recognized independent laboratories (except tests conducted at U.S.G. Research facilities for sound attenuation of New Horizons patterns and Super-E panels in AURATONE line, and sound absorption of VISTA SONIC Panels) according to: ASTM C423 for sound absorption, ASTM C523 for light reflectance, AMA 1-II for sound attenuation. Test specimen mounting is coded: (for sound absorption) #1 or B—adhesive application to gypsum board, #2 or D20—stapled to wood furring strips, #7 or E405—metal suspension system; (for sound attenuation) 1st

letter: Ad—Adhesive attachment, C—Continuous at partitions, I—Interrupted at partitions; 2nd letter: C—Concealed suspension system, E—Exposed suspension system; 3rd or 4th letter: F—Flat splines, T—Tee splines, a—one layer 1½" THERMAFIBER Sound Attenuation Blankets laid on ceiling continuous, d—two layers 1½" THERMAFIBER Sound Attenuation Blankets laid on ceiling, 4 ft. wide on each side of partition. Mountings B, D20 and E405 are the designations of new ASTM Standard 795-81 for mountings physically identical to old #1, 2 and 7 mountings, respectively. The new designations are

U.S.G. sound control ceilings SA-905

sound abso	rption	coeffic	ients			sound attenuation -			
mount-			enter freque			mount-	STC		
ing	range	125	250	500	1000	2000	4000	ing	range
		0.5		7.	07	00	00	A -1 (A)	50.54
1 7	.6575 .7080	.05 .70	.23 .72	.71 .60	.97 .80	.86 .92	.93 .97	Ad ⁽⁴⁾ ICF, CCF	50-54 25-29, 25-29
								101, 001	25-29, 25-29
1	.6575	.22	.21	.78	.99	.78	.59	_	_
7	.7080	.70	.63	.67	.82	.86	.62	_	
7	.7080	.57	.47	.63	.96	.99	.95	CCF, ICF	20-24, 25-29
	According to the second								
7	.6575	.46	.41	.60	.89	.89	1.02	ICF	35-39
7	.6575	.25	.31	.61	.96	.94	.90	IEd ⁽⁵⁾	45-49
7	.7080	.62	.51	.61	.90	.93	.93	CCF	35-39
7	.6575	.29	.28	.54	.98	.97	.91	CE ⁽⁵⁾ , CEd ⁽⁵⁾	35-39, 45-49
7	.6575	.32	.28	.58	.96	.95	.95	CE ⁽⁵⁾	35-39
7	.6575	.36	.33	.59	.90	.96	.95	CE ⁽⁵⁾	35-39
7	.7080	.59	.49	.64	.93	.94	.89	CCF	35-39
7	.6070	.34	.26	.56	.92	.87	.93	CE	35-39
7	.6575	.25	.31	.66	.90	.87	.86	CE ⁽⁵⁾	35-39
E405	.5565	.27	.32	.49	.75	.77	.73	IE & CE, CEa, CEd	35-39, 40-44, 45-49
E405	.5565	.21	.35	.61	.73	.61	.52	CE, CEa	40-44, 45-49
7	.5060	.31	.31	.49	.70	.70	.71	CE ⁽⁵⁾	35-39
7	.5565	.26	.30	.49	.74	.77	.79	CE	40-44
7	.5060	.28	.34	.57	.74	.61	.46	CE	35-39
E405	.5060	.26	.36	.63	.70	.51	.37	CE	40-44
E405	.5060	.22	.30	.49	.72	.59	.38	CE	35-39
7	.5565	.34	.32	.54	.81	.67	.55	CE	35-39
7	.5565	.32	.34	.67	.75	.59	.55	CE	40-44
E405	.45.55	.17	.29	.47	.70	.61	.36	CE	40-44
7	.3545	.25	.26	.33	.45	.50	.50	CE	35-39
7	.3545	.26	.25	.34	.48	.53	.46	CE	40-44
7	.5565	.25	.34	.56	.79	.73	.69	CE ⁽⁵⁾	40-44
7	.5060	.27	.32	.56	.72	.59	.47	CE ⁽⁵⁾	40-44
E405	.4555	.24	.26	.44	.65	.66	.61	CE	40-44
		.31		.42	.63	.68	.62	CE	40-44
E405	.4555	.31	.26	.42	.03	.08 grande from the control of	.62	UE	40-44
7	.5565	.19	.27	.55	.82	.68	.58	IE, CE	40-44, 35-39
7	.5565	.18	.30	.54	.84	.73	.63	CE CE	40-44
7						.66	.48	CE	40-44
	.5060	.23	.30	.53	.77				
7	.5060	.21	.31	.55	.80	.59	.37	CE	40-44
7	.5565	.32	.31	.55	.81	.66	.49	CE	40-44
0	40 50	47	EA	20	40	50	40		
2	.4050	.17	.54	.30	.42	.50	.48		40.44
7	.5565	.41	.32	.53	.81	.66	.51	CCF	40-44
E405	.5060	.29	.34	.53	.66	.57	.49	CCF	45-49
7	.5565	.32	.41	.59	.75	.74	.68	CCF	45-49
7	.5060	.36	.36	.61	.64	.57	.53	CCF	45-49
7	.5060	.39	.33	.52	.76	.65	.49	CCF	40-44
7	.5565	.39	.32	.54	.82	.63	.44		_
7	.5565	.42	.32	.52	.85	.68	.53	CCF	40-44
7	.5060	.40	.36	.43	.80	.62	.56	CCF	45-49
E405	.5060	.35	.34	.48	.71	.64	.53	CCF	40-44
	.5565	.44	.36	.60	.75	.65	.59	CCF	45-49
7				F 4	70	GE.	.62	CCF	10 11
7 7	.5060	.29	.34	.54	.72	.65	.02	001	40-44
	.5060 .5565	.43	.34	.56	.81	.67	.64	CCF	40-44

shown only for tests conducted since their effective date.

⁽²⁾Federal Specification SS-S-118B classifies Light Reflectance Coefficients (where 1.00 = 100% reflected) into Light Reflectance Grades designated as follows: LR 1, .75 or greater; LR 2, .70-.74; LR 3, .65-.69; LR 4, .60-.64; less than .60, ungraded. Tests are in accordance with ASTM C523 procedure.

⁽³⁾Formerly designated "fire hazard classification", including in order: flame spread, fuel contributed, smoke developed, conforming to Federal Spec. SS-S-118B.

⁽⁴⁾ Adhesive attachment of ceiling tile to 1/2" gypsum panels screw-attached to indirect-hung

Adhesive attachment of ceiling the to 22 gypsum panels screw-attached to indirecting suspension system interrupted at partitions.
 Shadow Line (rabbeted) edge configuration.
 LR Grades for seven available colors shown on page indicated.
 LR Grades for three available reflective tints shown on page 28.
 Value shown for white texture-coating, values for available laminated vinyl facings in white and four colors, and unfinished natural paper facing, shown on page 29.



ACOUSTONE Tile and Panels of molded mineral fiber —the premier name in acoustical ceilings, with good reason

- · distinctive, highly individual patterns
- efficient sound absorption, effective sound attenuation
- fire ratings to 2-hr., in 4 UL Designs
- wide range of types, sizes, patterns and colors
- custom sizes
- aluminum backing for greater resistance to fire and soiling
- special finish for severe soiling conditions
- precise dimensions and tested performance

ACOUSTONE Tile and Panels set the industry standard for beauty and efficient sound control. Mineral fibers are mixed with a binder and molded into lightweight, natural-textured units, each uniquely patterned. Fifteen soft, subdued tones offer coordinated design flexibility. Choose just the right color, edge configuration, and concealed or exposed suspension to match duty requirements. Should you be considering "open-plan" office design, ACOUSTONE ceilings perform superbly in numerous installations across the country.

ACOUSTONE ceiling products are ¾-in. thick in 12x12-in. tile, plus 24x24-in. and 24x48-in. panel, sizes. Tile generally come with square or bevel edges, and kerf, for concealed suspension; panels with square or Shadow Line (rabbeted) edges. Standard finish is a washable vinyl coating, factory-applied and heat-cured. An aluminum-foil backing (see below) is available, standard on all panels and some tile.

Practical non-standard sizes are available at extra cost. Special-service types are also available: Acoustone Firecode Tile and Panels for fire-rated requirements, Plastic-Coated finish for problem areas of severe soiling, and Foil-Backed tile (standard on all panels and Firecode Tile).

All types can be cleaned with a damp sponge, dry chemical rubber sponge, or vacuum cleaner; renewed with thinned, nonbridging paint, roll- or spray-applied (TAL Latex or other flat vinyl acrylic).

Closely controlled manufacturing tolerances provide precise dimensions and well-tailored fit. The line has been extensively tested for sound (according to ASTM C423 absorption and AMA 1-II attenuation procedures—see pages 4-5, 30), and fire performance (Surface Burning Characteristics conforming to Federal Spec. SS-S-118B—see page 4; and with four resulting UL Designs of up to 2 hr.—see pages 32, 33). See pages 4-5 for physical property data, the following pages for complete individual pattern availability and product data details.

Special-Service ACOUSTONE Tile/Panels... for fire performance and easy maintenance

ACOUSTONE FIRECODE Tile and Panels—1, 1½ and 2-hr. fire protection when used in UL Designs (see pages 32-33). No change from regular formulation in textural beauty, high sound absorption and light reflectance. Available, with UL labels, in all patterns except Boulder, and in colors. Some colors have fire-rating limitations (see your U.S.G. representative).

Plastic-Coated Acoustone Tile and Panels—factory-coated with an additional plastic covering to reduce maintenance where soiling is severe. Available in all Acoustone/Acoustone Firecode Tile and Panels, White only.

Foil-Backed Acoustone Tile and Panels—for improved sound attenuation, resistance to fire, heat loss/gain, and soiling.

limitations

Major changes in humidity noticeably affect acoustical ceiling product dimensions. ACOUSTONE Tile and Panels are sized and designed for use at standard occupancy temperature and humidity (65-85°F, no more than 80% RH). Do not use: (a) where continuously exposed to high humidity, which introduces a possibility of sag; (b) below wainscot height or where exposed to impact, abrasion or tampering. Do not apply Foil-Backed ACOUSTONE Tile with adhesives.

Do not begin installation until residual moisture from plaster, concrete or terrazzo work has dissipated. If ACOUSTONE Tile are installed in a rigid, concealed grid system with humidity higher or lower than that anticipated in service, allow for later dimensional changes. At 85°F and 90% RH, tile may be up to ½4 in/ft oversize, and may not fit into a fixed grid. Conversely, tile installed during low humidity may be undersize and will expand when humidity returns to normal.

Do not overlay material, such as insulation, on: (1) ceiling panels where high humidity can occur (it may cause objectionable panel sag), (2) fire-rated Acoustone Firecode ceilings (it nullifies the rating of UL Designs). To prevent objectionable panel sag in other cases of standard occupancy conditions, limit such overlaid material to 0.75 lb/ft² maximum.

Other ceiling qualifications required for UL Design fire rating include: (1) a fire-rated suspension system, (2) installation of the entire ceiling assembly as described in specified UL Design.



Pattern: ACOUSTONE Tile & Panels

Glacier—roughly natural, for visual excitement but quieting sound

Complements contemporary architecture; rough and heavily fissured texture adds a bold accent. The first such acoustical ceiling treatment, this screeded, unplaned finish is a perennial in popularity. Edges are nominally obscured by the pattern's richly etched texture.

Physical Dimensions (nominal)

Regular sizes (& thickness)
Tile: (3/4") 12x12"—SE (Item #701)

Panels: (3/4") 2x2', 2x4'—Sq (Items #706, 764), SL (Items #707, 711)

FIRECODE sizes (& thickness)
Tile: (¾") 12x12"—SE (Item #713)
Panels: (¾")* 2x2'—Sq, SL (Items #714, 715)

Weights

Regular Tile: 1.25 lb/ft² (unbacked), 1.30 lb/ft² (Foil-Backed) Regular Panels: 1.30 lb/ft² (all are Foil-Backed) FIRECODE Tile & Panels: 1.30 lb/ft² (all are Foil-Backed)

Colors (see below)

White, 15 colors (7 standard, 8 special, on panels only)

Light Reflectance (see pages 4-5) White: LR 3 (ASTM C523)

All colors: unclassified (coefficients less than .60)

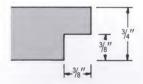
*Actual is min. 0.83".

Tile Edge & Kerf Dimensions .0625" Square edge (SE)





Square-cut (Sq)



Shadow Line (SL)

Colors: ACOUSTONE Panels

New colors: soft, subdued and *integral*—the key to coordinating an entire interior

ACOUSTONE products now come in an expanded new line of colors, especially coordinated to key your entire scenario of interior color. An extensive and careful study of the latest trends in color yielded these fifteen tones as most versatile trendsetters. Seven colors are on standard availability, eight on special with longer lead time required. They are especially selected for compatibility with the colors of Textone Vinyl-faced Gypsum Panels from U.S.G., of carpets from Hollytex and of fabrics and office furniture from leading manufacturers, to offer you total interior color coordination.

Quality of color counts, too. ACOUSTONE products offer solid-core color, for a big plus in permanence. Thanks to an exclusive process, color is clear-through the base mat, not just a surface coating. Panels won't expose nicks or scratches as glaring white, as ordinary painted products do.

Start at the top. Color your ceiling soft and subdued, to set the tone for your entire interior.

color-match tolerance

Colors are checked by spectrophotometric analysis according to the widely accepted "L.a.b." chromaticity coordinates system, with a tolerance of .5 maximum (Delta "E"). This value is considered *well within* normally accepted commercial tolerance for good color match. Apparent variation in color, however, can result from slight difference in: (1) texture and porosity of the substrate, (2) room lighting, and (3) subjective differences between observers. To minimize apparent color variations resulting from substrate production differences, all material in one unbroken area of ceiling should be used from the same *production lot* (indicated by *lot number* on each carton of material).

Standard colors for ACOUSTONE Panels



These color reproductions show colors as closely as possible within printing limitations. For exact colors, see actual samples of Color ACOUSTONE Tile or Panels offered by your U.S.G. sales representative.



Pattern: ACOUSTONE Tile & Panels

"F" Fissured—clean restraint of classic, understated beauty

Molding, screeding and planing results in a broad range of fissures to echo the natural beauty of travertine marble. These fissure variations assure no two faces exactly alike. A truly non-directional ceiling can be attained when 12x12-in. tile are installed with direction of fissures deliberately random and variation of fissure size/spacing in a full range. Naturalness then is emphasized, and the total ceiling takes on a timeless, monolithic look unmatched by any other product.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Tile: (¾") 12x12"—SE, BE (Items #101, 102)

Panels: (3/4") 2x2', 2x4'—Sq (Items #131, 135), SL (Items #132, 136)

FIRECODE sizes (& thickness)

Tile: (3/4") 12x12"—SE, BE (Items #138, 139)

Panels: (3/4") 2x2'-Sq, SL (Items #140, 141)

Weights

Regular Tile: 1.25 lb/ft² (unbacked), 1.30 lb/ft² (Foil-Backed)

Regular Panels: 1.30 lb/ft² (all are Foil-Backed)

FIRECODE Tile & Panels: 1.30 lb/ft2 (all are Foil-Backed)

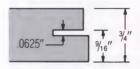
Colors (see page 9)

White

Light Reflectance (see pages 4-5)

White: LR 1 (ASTM C523)

Tile Edge & Kerf Dimensions



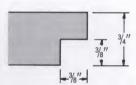
.0625" 3/4"

Square edge (SE)

Bevel edge (BE)

Panel Edge Dimensions





Square-cut (Sq)

Shadow Line (SL)

Pattern: ACOUSTONE Panels

Seacrest—frothy and soft-formed, as with running surf

Reticulated, nearly non-directional Seacrest pattern brings a unique excitement to ceilings. Panels only, with square-cut or Shadow Line edge configuration for lay-in application.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: $(\frac{3}{4})$ 2x2', 2x4'—Sq (Items #717, 719), SL (Items #718, 765)

FIRECODE sizes (& thickness)

Panels: $(\frac{3}{4}")$ 2x2'—Sq, SL (Items #721, 722)

Weights

Regular Panels: 1.30 lb/ft² (all are Foil-Backed) FIRECODE Panels: 1.30 lb/ft² (all are Foil-Backed)

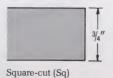
Colors (see page 9)

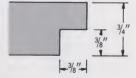
White

Light Reflectance (see pages 4-5)

White: LR 4 (ASTM C523)

Panel Edge Dimensions





Shadow Line (SL)





Pattern: ACOUSTONE Panels

Boulder—big and dramatic accent for grand-scale interiors

For a ceiling to match massive-proportioned interiors and roughhewn surfaces. Bold enough to read on very high ceilings. Panel sizes emphasize the magnified scale, Shadow Line (rabbeted) edge mates pattern roughness with suspension grid.

Physical Dimensions (nominal)

Regular sizes (& thickness)
Panels: (¾") 2x2', 2x4'—SL (Items #745, 746)

Weights

Regular Panels: 1.30 lb/ft2 (all are Foil-Backed)

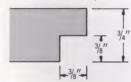
Colors (see page 9)

White

Light Reflectance (see pages 4-5)

White: unclassified (coefficients less than .60)

Panel Edge Dimensions



Shadow Line (SL)

ACOUSTONE Space Units

of molded mineral fiber—simple modules supplement sound absorption, control reverberation

Uncontrolled reverberations magnify noise and diffuse conversation. ACOUSTONE Space Units, plaques molded of standard ACOUSTONE mineral-fiber material, effectively control reverberation and noise build-up in a wide variety of settings. Space Units can also eliminate "flutter echo", and treat "spot" problem areas in new construction or remodeling. They can be used either as a supplement to other acoustical control, or as primary acoustical treatment.

To absorb sound efficiently, a simple metal-clip mounting exposes *all six surfaces*. The Space Units can be added in varying numbers and arrangements—to areas of, or entire, walls and/or ceilings according to absorbency needs and prevailing sound frequencies. For complete design information, see U.S.G. data folder SC-823.

Physical Dimensions (nominal)

Regular size (& thickness) Space Units: $(2^{1/4})$ $10^{1/2}$ x $10^{1/2}$, Sq—Glacier, Finesse (Items #716, #436)

Weight

3 lb/Unit

Color

White

Finish

Washable vinyl coating, factory-applied and heat-cured

Light Reflectance (see pages 4-5)

Finesse pattern: LR 1; Glacier pattern: LR 3 (ASTM C523)

limitations

Do not use ACOUSTONE Space Units for ceiling or overhead installation where subjected to impact, water immersion, splashing or condensation. They may be used under certain adverse conditions of temperature and humidity (contact your U.S.G. sales representative for acceptability). Rotation limits Unit spacing to a minimum 13 in. o.c. and $7\frac{1}{2}$ in. from any obstruction.

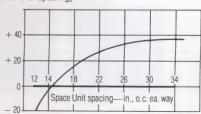
Sound Absorption (ASTM C423 test procedure)

	sabins/unit (1)											
product	band center frequency—Hz											
	125	250	500	1000	2000	4000						
ACOUSTONE Space Units at 15" o.c. ea. way (2)	0.2	0.6	1.4	1.5	1.4	1.3						

(1) One sabin is the absorption equivalent of one square foot of material having an absorption coefficient of 1.00.

(2) Units are clip-mounted, spaced in a regular pattern over a fairly large area of treated wall or ceiling. Other spacings may be used, but Space Unit absorption must be adjusted to chart below.

Space Unit Absorption-Adjustment* (for other than 15" o.c. spacing)



*Absorption change % indicated is based upon frequencies from 500 to 4000 Hz, since the 125- and 250-Hz bands show negligible change (at greater than 15 in. o.c.) and cannot be extrapolated (at less than 15 in. o.c.).

AURATONE Panels and Tile of mineral fiber—provide service flexibility, beauty and practicality, economically

- balanced and efficient acoustical control, excellent ratings
- fire ratings up to 3 hr., in 13 UL Designs
- surprising value—superb performance and obvious beauty—even tile at panel prices
- broad availability—wide choice of sizes, edges, thicknesses;
 special service for fire, abuse, high humidity, easy maintenance

AURATONE Panels and Tile are the value leader in acoustical ceilings: maximum total performance at minimum cost, and broad, versatile availability. For esthetics, the selection is diverse: five standard patterns plus four each of deep-texture and multi-module patterns, others for special severe-abuse and high-humidity service; seven colors in selected patterns, edge configurations for flush and recessed-grid suspension.

AURATONE ceiling products are a result of carefully controlled formulation of mineral fiber material. Two thicknesses extend the range of sound and fire performance. The standard finish, a washable vinyl coating factory-applied and heat-cured, resists soiling. When necessary, it can be easily cleaned, with a damp sponge, dry chemical rubber sponge or vacuum cleaner. To renew without significant loss of acoustical properties, rollor spray-paint using a thinned, non-bridging product (TAL Latex or other flat vinyl acrylic). Non-standard sizes of panels and tile can be special-ordered in widths ranging from 12 to 30 in., lengths from 24 to 60 in. Special-service types for high-soiling, sever-abuse, high-humidity and grand-scale areas are described below and on following pages.

AURATONE Panels combine performance and economy with functional versatility. They go up fast, with widths from 2 to 4 ft., lengths from 2 to 5 ft., for minimum installation cost and easy access to above-ceiling utilities. Square or Shadow Line (rabbeted) edge configurations provide flush or recessed-grid appearance. Four special panel types offer: (1) extra resistance to sag for high-humidity areas, and extra-large size for grand-scale rooms, (Super-E Adverse Environment panels, page 21), (2) extra resistance to impact and surface abrasion (GLATEX™ Impact Panels, pages 22-23), (3) extra-deep texture (New Horizons Series panels, pages 24-25) and (4) a tiled or multi-module look (The Illusion Ceiling Series panels, pages 26-27).

Auratone Tile are available in sizes from 12x12 in. to 24x24 in., two edge designs to accommodate concealed spline suspension, and stapled or adhesive attachment. In five patterns of white for both standard and fire-rated applications.

AURATONE Panels and Tile have been extensively tested for sound (according to ASTM C423 absorption and AMA 1-II attenuation procedures—see pages 4-5, 30), and fire performance (Surface Burning Characteristics conforming to Federal Spec. SS-S-118B—see page 4; and with thirteen UL Designs resulting, of up to 3 hr.—see pages 32-33). See pages 4-5 for physical property and sound absorption data; page 30 for complete sound attenuation test data. Individual pattern availability details follow.

Special-Service Auratone Panels/Tile... for extra resistance to fire, soiling, high humidity and abnormal abuse

Auratone Firecode Panels and Tile—1, 1½, 2, and 3-hr. fire protection when used in UL Designs (see pages 32-33). Patterns, colors same as Auratone Panels and Tile; sound and other physical properties change. UL label service available in all patterns and Omni Fissured colors of standard sizes. UL labels generally are available on non-standard sizes. Some colors have fire-rating limitations (see your U.S.G. representative).

Plastic-Coated Auratone Panels and Tile—factory-coated with an additional plastic covering to reduce maintenance where potential for heavy soiling is great. Available in *White* only, all Auratone/Auratone Firecode Panels and Tile.

AURATONE Super-E Adverse Environment Panels—faced and backed with aluminum foil to provide greater sag resistance for high-humidity applications and for super-size panels (4x4-ft. available) ideal in rooms of grand scale.

GLATEX AURATONE Impact Panels—extra resistance to impact and abrasion—see pages 22-23.

limitations

Major changes in humidity noticeably affect acoustical ceiling product dimensions. AURATONE Panels and Tile are sized and designed for use at standard occupancy temperature and humidity (65-85°F, no more than 80% RH). Do not use: (a) where continuously exposed to high humidity, which introduces a possibility of sag; (b) below wainscot height or where exposed to impact, abrasion or tampering.

Do not begin installation until residual moisture from plaster, concrete or terrazzo work has dissipated. If AURATONE Tile are installed in a rigid, concealed grid system with humidity higher or lower than that anticipated in service, allow for later dimensional changes. At 85°F and 90% RH, tile may be up to ½4 in/ft oversize, and may not fit into a fixed grid. Conversely, tile installed during low humidity may be undersize and will expand when humidity returns to normal.

Do not overlay material, such as insulation, on: (1) ceiling panels where high humidity can occur (it may cause objectionable sag in standard Auratone Panels—use Super E panels), (2) fire-rated Auratone Firecode ceilings (it nullifies the rating of UL Designs). To prevent objectionable panel sag in cases of standard occupancy conditions, limit overlaid material to 0.75 lb/ft² maximum, or use Super-E panels.

Other ceiling qualifications required for UL Design fire rating include: (1) a fire-rated suspension system, (2) installation of the entire ceiling assembly as described in specified UL Design.



EARTHTONE™ Colors— muted and surface-coated on various AURATONE Panel/Tile patterns to key your color design

These soft hues blend with the colors and natural materials of contemporary architecture. Economical color for ceilings with plus performance—today's value leader. The seven colors shown are available standard on all panels of: Omni Fissured pattern, the four New Horizons deep-texture patterns and The Illusion Ceiling Series—in all size/edge combinations.

color-match tolerance

Colors are checked by spectrophotometric analysis according to the widely-accepted "L.a.b." chromaticity coordinates system, with a tolerance of .5 maximum (Delta "E"). This value is considered *well within* normally accepted commercial tolerance for good color match. Apparent variations in color, however, can result from slight difference in: (1) texture and porosity of the substrate, (2) room lighting, and (3) subjective differences between observers. To minimize apparent color variations resulting from substrate production differences, all material in one unbroken area of ceiling should be used from the same *production lot* (indicated by *lot number* on each carton of material).



These color reproductions show colors as closely as possible within printing limitations. For exact colors, see actual samples of Color AURATONE Panels or Tile offered by your U.S.G. sales representative.

Fissured random fissures recalling deep crevasses

The rugged texture of deep, random fissuring blends with most decorating styles—traditional or contemporary; offers functional, efficient sound control.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: $(\frac{5}{8}")$ 2x2', 2x4', 2x5'—Sq (Items #560, 562, 563),

SL (Items #506, 507, --)

(3/4") 2x2', 2x4', 2x5'—Sq (Items #359, 361, 362), SL

Tile: (%16") 12x12"—St (Item #500)

(5/8") 12x12"—BE (Item #504)

(3/4") 12x12"—BE

FIRECODE sizes (& thickness)

Panels: (5/8") 2x2', 2x4'—Sq (Items #585, 586), SL (Items #517, 518)

(34") 2x2', 2x4', 2½x5'—Sq (Items #387, 388, —)

Tile: (5/8") 12x12"—BE (Item #515)

(¾") 12x12"—BE

Weights

Regular Panels: (5/8") 0.81 lb/ft2; (3/4") 1.00 lb/ft2 Regular Tile: (5/8") 0.90 lb/ft²; (3/4") 1.10 lb/ft² FIRECODE Panels & Tile: (5/8") 1.15 lb/ft2; (3/4") 1.37 lb/ft2

Colors (see below)

Light Reflectance (see pages 4-5)

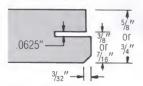
White: LR 1 (ASTM C523)

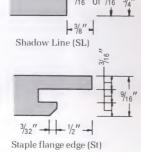
Panel Edge Dimensions



Square-cut (Sq)

Tile Edge & Kerf Dimensions







Omni Fissured tailored in perforation and fissure, shaded in a sextet of earthtones

This random combination of non-directional fissures and perforations works hard at controlling sound, is neat and good-looking. The random, "omni-direction" pattern takes on a natural, casual appearance to harmonize with almost any design scheme. Available in The Illusion Ceiling Series of panels (see pages 26-27) as well as standard panels and tile.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (5%") 2x2', 2x4', 2x5'—Sq (Items #344, 345, 346), SL (Items #323, 330, 331)

Tile: (5/8") 12x12"—BE (Item #320)

FIRECODE sizes (& thickness)

Panels: (% ") 2x2', 2x4'—Sq (Items # 338, 339), SL (Items # 336, 337)

Tile: (5/8") 12x12"—BE (Item #335)

Weights

Regular Panels: (5/8") 0.81 lb/ft²; (3/4") 1.00 lb/ft²

Regular Tile: (5%") 0.90 lb/ft²; (3/4") 1.10 lb/ft²

FIRECODE Panels & Tile: (5/8") 1.15 lb/ft²; (3/4") 1.37 lb/ft²

Colors (see below)

White, 7 colors (standard)

Light Reflectance (see pages 4-5)

White: LR 1 (ASTM C523)

Manila, Pumice: LR 3 (estimated)

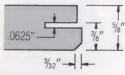
Clay Gray, Ebony, Oakwood, Sandstone, Mesa Red: unclassified

(coefficients less than .60)

Panel Edge Dimensions



Tile Edge & Kerf Dimensions



Pin-Perforated mixed random medium and small with ordered regularity

The fine and coarse perforations each in random combine into a clean, interwoven texture. Adapts well to any interior design scheme, especially contemporary.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (5/8") 2x2', 2x4', 2x5'—Sq (Items #552, 554, 555)

Tile: (5/8") 12x12"—BE (Item #501)

FIRECODE sizes (& thickness)

Panels: (5/8") 2x2', 2x4'—Sq (Items #581, 582)

Tile: (5/8") 12x12"—BE (Item #514)

Weights

Regular Panels: (5/8") 0.81 lb/ft²; (3/4") 1.00 lb/ft² Regular Tile: (5/8") 0.90 lb/ft²; (3/4") 1.10 lb/ft²

FIRECODE Panels & Tile: $(5\!/\!8'')\,1.15$ lb/ft²; $(3\!/\!4'')\,1.37$ lb/ft²

Colors (see below)

White

Light Reflectance (see pages 4-5)

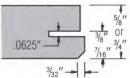
White: LR 1 (ASTM C523)

Panel Edge Dimensions



Square-cut (Sq)

Tile Edge & Kerf Dimensions





Nordicfine perforations plus texture combine into pebbled surface

This combination of fine perforations and texture creates a pleasing surface appearing pebbled and monolithic, but not at all "acoustical". Make no mistake—it definitely is.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (5/8") 2x2', 2x4'—Sq (Items #572, 574), SL (Items #523, 524) Tile: (5/8") 12x12"—BE (Item #525)

FIRECODE sizes (& thickness) Panels: (5/8") 2x2', 2x4'—Sq (Items #595, 596)

Tile: (5/8") 12x12", 12x24"—BE

Weights

Regular Panels: (5/8") 0.81 lb/ft2; (3/4") 1.00 lb/ft2

Regular Tile: (5/8") 0.90 lb/ft2; (3/4") 1.10 lb/ft2

FIRECODE Panels & Tile: (5%") 1.15 lb/ft²; (3¼") 1.37 lb/ft²

Colors (see below)

Light Reflectance (see pages 4-5)

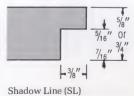
White: LR 1 (ASTM C523)

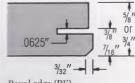
Panel Edge Dimensions



Square-cut (Sq)

Tile Edge & Kerf Dimensions







Filigreetailored and formal, appropriate for large, traditional settings

Fine, non-directional fissures give an overall impression of texture to embellish interior design schemes, without introducing a pattern of their own.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (5/8") 2x2', 2x4', 2x5'—Sq (Items #564, 566, 567), SL (Items #509, 510, —)

(%") 2x2', 2x4', 2x5'—Sq (Items #367, 369, 370), SL (Items #315, 316, —) Tile: (%") 12x12"—BE (Item #508)

(3/4") 12x12"—BE (Item #307)

FIRECODE sizes (& thickness)

Panels: (5/8") 2x2", 2x4'—Sq (Items #589, 590), SL (Items #521, 522)

(3/4") 2x2', 2x4'—Sq (Items #389, 390)

Tile: (5/8") 12x12"—BE (Item #519) (3/4") 12x12"—BE (Item #318)

Regular Panels: (5/8") 0.81 lb/ft2; (3/4") 1.00 lb/ft2

Regular Tile: (5%") 0.90 lb/ft²; (3/4") 1.10 lb/ft²

FIRECODE Panels & Tile: (5/8") 1.15 lb/ft2; (3/4") 1.37 lb/ft2

Colors (see below)

White

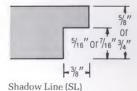
Light Reflectance (see pages 4-5)

White LR1 (ASTM C523)

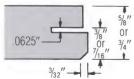
Panel Edge Dimensions



Square-cut (Sq)



Tile Edge & Kerf Dimensions





Panels: AURATONE Super-E for adverse environment

Super-E foil-wrapped for sag-resistant spanning and "four-square" scale, even in soggy environments

- spanning performance apparently sag-free:
- —in high humidity
- -in 4x4-ft. size
- -under 3.5 lb/ft² superimposed load
- 4x4-ft. jumbo size:
- -is more compatible in super-scale rooms
- -accommodates large diffusers and lighting fixtures

New Auratone Super-E Acoustical Ceiling Panels for Adverse Environments are foil-faced and -backed for much greater sag resistance in high-humidity (over 85°F with more than 80% RH) environments, or under superimposed load. They are designed for: (1) swimming pools and similar applications with high-humidity environments, (2) ceilings requiring relatively heavy overlaid insulation consistent with humidity conditions, (3) normal-environment applications where jumbo sizes are of more appropriate scale.

Super-E Panels come in two sizes for applications where standard panels would sag excessively: 2x4-ft.—for high humidity conditions, or normal conditions and overlaid with insulation or other material too heavy for standard panels; 4x4-ft.—for grand-scale installations requiring large panels to be in scale.

Results of tests on the 2x4-ft. panel indicate a capacity of 3.5 lb/ft² of overlaid material at 90°F and 90% RH, without apparent sag. The large 4x4-ft. panels are more in keeping with the magnified scale of ballrooms, transportation terminals and similar installations. Not only do they improve the esthetics, but make ceiling installation much easier around the much larger ceiling diffusers and lighting fixtures usually found in these areas.

The core of Super-E Panels is, like standard Auratone Panels, made up of water-felted mineral-wool fibers. The standard finish, aluminum foil stipple-painted white, resists soiling and damage from minor knocks, and is easy to clean. Panels are available in Micro-Perforated pattern (illustrated) for suspension in any conventional exposed-grid system.

 ${f Limitations}$ —To prevent objectionable panel sag, limit overlaid material to 3.5 lb/ft² maximum.

Patterns

Micro-Perforated

Physical Dimensions (nominal)

Regular sizes (& thickness) Panels: (5/8") 2x4', 4x4'—Sq

Weights

Micro-Perforated pattern

Regular Panels: (5/8") 0.90 lb/ft²

Colors (see below)

Light Reflectance

White: LR 1 (ASTM C523)

Panel Edge Dimensions



Square-Cut (Sq)



Panels: GLATEX™ AURATONE for impact/abrasion resistance

GLATEX impact panels for ceilings facing a life of scrapes and hard knocks

- scuff-resistant hard-shell surface
- impact-resistant extra-strong core
- panel-positioning clips available
- typical Auratone Panel balanced acoustical control
- fire-performance formulation optional
- low cost and fast installation
- pleasing, versatile pattern

GLATEX AURATONE Impact Acoustical Panels are ideal wherever objects—from basketballs to flag poles—are apt to be bumped, knocked, banged or thrown against the ceiling. Locker rooms, handball and racquetball courts, stairways, church basements and meeting rooms are typical. Superior impact- and surfacedamage resistance, low cost, plus fast installation, make GLATEX Impact Acoustical Panels a stand-out value.

The GLATEX Panel pattern is a deep, pleasing texture that keeps on looking new, hiding minor scratches, gouges, and scrapes. And GLATEX Panels provide the sound control typical of AURATONE Panels, an optimum balance of absorption and attenuation.

Panels are suspended in any conventional exposed-grid system, providing an impact-resistant acoustical ceiling. Optionally, GLATEX Panels can be secured with Position Control Clips. These spring-type clips flex under impact but return a panel to proper position in the grid when impact might have dislodged it. They still permit plenum access for utility maintenance, although with slightly less ease, and may be desirable in areas of frequent, high impact.

Two key physical properties of GLATEX Panels account for their superior impact performance: (1) greater bending strength to resist breakage, and (2) an extra-tough surface that takes minor scuffs and abrasions in stride. Tested to 20-25 in/lb in a Gardner Impact Test, GLATEX Panels showed virtually no damage. Subjected to the Ball Hardness Test (ASTM C367), which measures ability to resist damage, this extra-hard finish required 225 lb (155 lb for FIRECODE Panels) of force on a 2-inch steel ball to depress the panel surface only ¼ inch. This hardness test performance, plus an ability to hide minor damage, was substantially superior to that of all competing products tested. With Position Control Clips in place, 2x2 ft. panels resisted impacts up to 180 in/lb without breakage or displacement from grid.

GLATEX Impact Acoustical Panels are made up of water-felted mineral-wool fibers. The basic Auratone Panel formulation is modified to greater density, providing more strength to resist impact without damage. Panels are available regular, and also available as GLATEX AURATONE FIRECODE Panels for fire-rated requirements. When suspended in qualifying grid systems, the latter type can qualify for certain UL Design ceiling assembly fire ratings of up to 3 hr. No hold-down clips are needed because panels exceed the UL-required minimum weight of 1.00 lb/ft².

Limitations—Major changes in humidity noticeably affect acoustical ceiling product dimensions. AURATONE Panels are sized and designed for use at standard occupancy temperature and humidity (65-85°F, no more than 80% RH). Do not use where continuously exposed to high humidity, which introduces a possibility of sag.

Do not begin installation until residual moisture from plaster, concrete or terrazzo work has dissipated. Do not overlay material, such as insulation, on: (1) ceiling panels where high humidity can occur (it may cause objectionable panel sag), (2) fire-rated GLATEX AURATONE FIRECODE ceilings (it nullifies the rating of UL Designs). To prevent objectionable panel sag in cases of standard occupancy conditions, limit such overlaid material to 0.75 lb/ft² maximum.

Other ceiling qualifications required for UL Design fire-ratings include: (1) a fire-rated suspension system, (2) installation of the entire ceiling assembly as described in specified UL Design.

Patterns

One, as illustrated, exclusively GLATEX

Physical Dimensions (nominal)

Regular sizes (& thickness) Panels: (5%") 2x2', 2x4'—Sq (Items #625, 626)

FIRECODE sizes (& thickness)
Panels: (%") 2x2', 2x4', 2½x5'—Sq (Items #627, 628)

Weight

Regular Panels: (5%") 1.20 lb/ft² FIRECODE Panels: (5%") 1.22 lb/ft²

Colors (see below)
White

Light Reflectance (see pages 4-5) White: LR 1 (ASTM C523)

Panel Edge Dimensions



Square-cut (Sq)

UNITED STATES GYPSUM

Deep Texture Patterns: AURATONE Panels The Illusion Ceiling Series AURATONE Panels

New Horizons deep or moderate natural textures at moderate price

- natural, deep-texture look
- four beautiful patterns
- balanced sound control of AURATONE Panels
- low cost and fast, panel installation

The New Horizons patterns combine the cost and functional advantages of an Auratone Panel with a natural, deep-textured face. These new patterns introduce natural-textured esthetics to Auratone Panel versatility and performance.

Four New Horizons patterns, resembling relief maps of rough terrain, are available in three size/edge combinations on Auratone regular and Firecode Panels: Aspen, Tahoe, Teton in deep texture, plus Cascade in moderate texture. Aspen and Tahoe deep-texture patterns are also available on The Illusion Ceiling Series complete line of multi-module panels (see pages 26-27).

New Horizons Auratone Panels have excellent performance properties. With seven colors to choose from, you can harmonize any of the textures with many settings, traditional or contemporary.

Limitations—All limitations of standard Auratone Panels apply—see page 14.

Patterns

Deep Texture: Aspen, Tahoe, Teton Moderate Texture: Cascade

Physical Dimensions (nominal)

Regular sizes (& thickness) Deep Texture Panels: (¾") 2x2', 2x4'—SL Moderate Texture Panels: (5\%") 2x4'—Sq

Weights

Panels (regular only): ($\frac{3}{4}$ ") 1.00 lb/ft²

Colors (see below) White, 7 colors (standard)

Light Reflectance (see pages 4-5)

White: LR 1 (ASTM C523) Manila: LR 3 (estimated) Pumice: LR 4 (estimated)

Clay Gray, Ebony, Oakwood, Sandstone, Mesa Red: unclassified (coefficients less than .60)

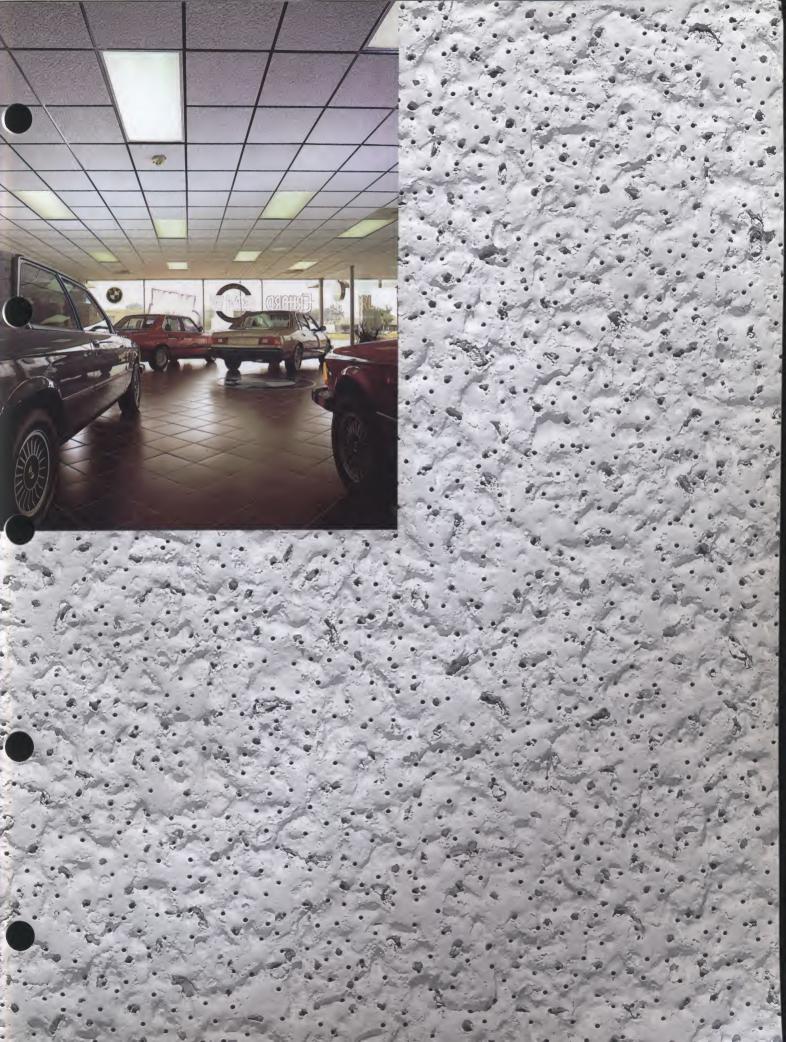
Panel Edge Dimensions



Shadow Line (SL)

EARTHTONE Colors (see page 15)





Panels: The Illusion Ceiling Series AUR ATONE

The Illusion Ceiling Series for the interest of tile or varied modules, at large-panel price

- tile look at panel price
- appearance improvement of problem-size rooms
- three patterns, white and seven soft colors
- two sizes: 24x48 in., 20x60 in., 5/8 in. thick
- standard Auratone and Auratone Firecode Panel performance

The Illusion Ceiling Series of Auratone and Auratone Firecode Panels gives ceilings a monolithic tile look—or the preferred scale of smaller modules—along with the cost/installation/maintenance benefits of large panels. The Illusion Ceiling Series panels provide the same fine sound, fire, light-reflectance and maintenance properties, and Earthtone/white Color selection, as standard Regular and Firecode Panels.

These are large AURATONE Panels, face-routed and edge-rabbeted to define smaller modules and permit suspension tees to blend into the plane of the panel face. With tee and panel faces flush, tees of a low-gloss finish become nearly imperceptible. The illusion of tile, smaller panels or strips results, depending upon the variation.

This series of Auratone Panel in three patterns gives four distinctly different Illusions: (1) Eight/12 Tile, (2) Two/24 panels, (3) Four/48 Strips, (4) Three/20 Panels. The latter utilizes a 20x60-in. panel, the others 24x48-in. Each module variation has its own decorative potential for plain or problem rooms, to embellish or correct. Illusion: Auratone Panel versatility multiplied once more.

Limitations: All limitations of standard Auratone Panels apply—see page 14.

 $\label{eq:patterns} \textbf{Patterns} \mbox{ (Item nos. for W hite color in order of, respectively: Eight/12, Two/24, Four/48, Three/20 designs)}$

Regular panels

Omni Fissured (see page 17)—Items # 602, 600, 601, 605

Aspen (see pages 24-25)

Tahoe (see pages 24-25)

FIRECODE panels

Omni Fissured (see page 17)

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: $(\frac{5}{8}")$ 24x48" (Eight/12, Two/24, Four/48 designs)

20x60" (Three/20 design)

FIRECODE sizes (& thickness)

Panels: (5/8") 24x48" (Eight/12, Two/24, Four/48 designs)

20x60" (Three/20 design)

Weights

Regular Panels: (5/8") 0.81 lb/ft² FIRECODE Panels: (5/8") 1.15 lb/ft²

Colors (see below)

White, 7 colors (standard)

Light Reflectance (see page 4-5)

White: LR 1 (ASTM C523)

Manila, Pumice: LR 3 (estimated)

Clay Gray, Ebony, Oakwood, Sandstone, Mesa Red: unclassified (coefficients less than .60) $\,$

Panel Designs/Dimensions (nominal—Omni Fissured pattern shown on panel designs)



Eight/12 Tile—24x48-in. panel with the look of tile at low-cost panel price and accessibility.



Two/24 Panels—24x48-in. panel economy and accessibility, and a square-module look



Four/48 Strips—24x48-in. panel with the linearity of 6-in. wide strips to give a short room the illusion of greater length (used longitudinally), a long room greater width (used transversely).



Three/20 Panels—20x60-in. panel with a square module in the correct scale for small rooms, yet affording large-panel economy.

EARTHTONE Colors (see page 15)



Edge/Panel Configuration





VISTA SONIC Mirrored Acoustical Panels sophisticated combination of glamor, security and sound-absorbency

- optically clear image-reflecting and sound-absorbing
- · lower-cost than glass-mirrored ceilings
- safe and shatter-free
- · easily accessible to utilities above ceiling
- shoplifting-deterring
- quickly installed, easily cut out for penetrations
- simply cleaned/maintained

VISTA SONIC Mirrored Acoustical Ceiling Panels are a shatterproof, low-cost alternate to mirrored glass. They provide both distortion-free image reflection of mirror quality, and AURATONE Panel sound-absorbency—never before found in reflective ceilings.

These panels create dramatic decorative effects, and heighten visual space perception. Available in silvered, gold-, bronze- or black-reflective tints, they lend interiors transparent color. In shops and stores, they expand the spatial impact of product displays. In allowing store-wide observation, they deter shoplifting and pilfering more effectively than suspended mirrors, less expensively than closed-circuit TV systems, more attractively than either. Increasingly VISTA SONIC Panels pay their way on a security basis.

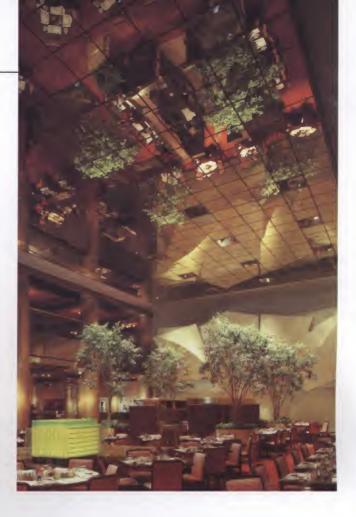
The VISTA SONIC Panel is a 5%-in. thick Auratone Mineral Acoustical Panel set in a rigid, extruded aluminum frame, with .001-in. thick, aluminized-back-surface polyester film stretched over it. This results in a 15%-in. thick mirror assembly of optical clarity, of standard 24x24-in. or 24x48-in. nominal size and square edge, for conventional lay-in panel installation in exposed-grid suspension systems. The film is tough and resilient to resist damage, and non-static to minimize dust build-up and need for cleaning. A ½-in. air space behind the film allows it to flex under minor impact without damage, and to maximize sound absorption by the Auratone Panel behind it. Offers all the advantages of conventional panels in exposed-grid suspension: large, 2x2-ft. or 2x4-ft. sizes; fast installation; easy accessibility for above-ceiling maintenance.

Limitations

Major changes in humidity noticeably affect acoustical ceiling product dimensions. VISTA SONIC Panels are sized and designed for use at standard occupancy temperature and humidity (65-85°F, no more than 80% RH). Do not use: (a) where continuously exposed to high humidity, which introduces a possibility of sag; (b) below wainscot height or where exposed to impact, abrasion or tampering.

Do not begin installation until residual moisture from plaster, concrete or terrazzo work has dissipated. Protect film from damage by sharp edges, abrasion or undue pressure. Cut out holes for penetrations with the special technique developed for this purpose (see U.S.G. data sheet SC-835). Panels cannot be cut down to smaller size.

Do not overlay material, such as insulation, on VISTA SONIC Panels where high humidity can occur (it may cause



objectionable panel sag). To prevent sag in cases of standard occupancy conditions, limit such overlaid material to $0.75~\rm lb/ft^2$ maximum.

Physical Dimensions (nominal)

Regular sizes (& thickness) Panels: (15/16") 2x2', 2x4'

Weight

Regular Panels: 1.45 lb/ft²

Colors

Silvered, Gold-, Bronze- and Black-Reflective

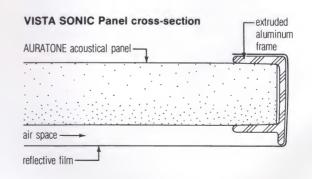
Light Reflectance (see pages 4-5)

Silvered: LR 1 (ASTM C523) Gold-reflective tint: LR 1

Bronze- and Black-reflective tints: unclassified (coefficients less than .60)

Maintenance

Remove slight dents and wrinkles from the film with a hot-air blower of the type used for hair styling—simply direct the airstream at the panel until wrinkles disappear. Cleaning is quickly done with soft polishing cloth and household cleaners—see U.S.G. data sheet SC-835.



USG Gypsum Ceiling Panels the only complete low-cost, nonacoustical line: exterior/interior application, wide color/texture choice, fire ratings, USDA acceptance

- versatile application: indoors, "protected" outdoors, firerated, food service (USDA-accepted)
- good sound attenuation and impact resistance
- extra economy for non-acoustical and unfinished applications
- wide choice of colors, textures and facings—all easily cleaned

USG Gypsum Ceiling Panels are especially made for exposed-grid ceilings where budget and easy maintenance are of prime importance. Highly functional, these lay-in panels offer a range of facings, and types for protected exterior as well as interior applications. Soil-resistant facings and easy cleaning make them ideal for food service areas. FIRECODE "C" core available for fire rating requirements up to 2 hours.

Panels are a noncombustible gypsum core, paper-wrapped and finished with a textured white coating, or laminated with white or colored vinyl facings. Plain unfinished panels are also available. All panels are square-edged for lay-in with standard exposed-grid suspension systems. The texture-coated type (not available in some areas of Eastern and Southwestern U.S., consult your U.S.G. representative) is produced in exterior and interior formulations for economical ceilings and soffits with high light reflectance. The 2-mil vinyl laminated-facing type has excellent flame-resistance properties. The 6-mil type is available in four colors. Easy washability and good abrasion resistance have earned them USDA acceptance for use in food processing/service areas. Unfinished panels provide rock-bottom economy where finish is of secondary importance to budget. Can be field-painted with job-required colors, in the same way as drywall panels.

Limitations

Do not use: (a) in areas where sound absorption is a requirement, (b) where exposure to moisture is extreme or continuous, (c) where directly exposed to weather or water. Provide cross ventilation in unheated or enclosed space above ceiling panels. For exterior applications, the suspension system must be approved by its manufacturer for exterior use.

Do not overlay material, such as insulation, on: (1) ceiling panels where high humidity can occur (it may cause objectionable panel sag), (2) fire-rated USG Gypsum Panel ceilings (it nullifies the rating of UL Designs).

Other ceiling qualifications required for UL Design fire rating include: (1) a fire-rated suspension system, (2) installation of the entire ceiling assembly as described in specified UL Design.

Physical Dimensions (nominal)

Regular sizes (& thickness)

Panels: (1/2") 2x2', 2x4'—Sq (Interior)

(1/2") 2x2', 2x4'—Sq (Exterior)

FIRECODE sizes (& thickness)

Panels: (1/2") 2x2', 2x4'—Sq (Interior)

(1/2") 2x2', 2x4'—Sq (Exterior)

Regular Panels: 1.90 lb/ft2 FIRECODE Panels: 1.90 lb/ft2

Colors (see below)

White, Shell, Bone, Adobe, Desert Sand, natural unfinished-paper gray

Light Reflectance (see pages 4-5)

White (texture-coated), Shell: LR1 (ASTM C523)

White (2-mil vinyl): LR 1 (ASTM C523)

Bone: LR 3 (ASTM C523)

Adobe, Desert Sand: unclassified (coefficients less than .60)

Surface Burning Characteristics (flame spread/fuel contributed/smoke developed)

Texture-coated panels: 15/0/0

6-mil vinvl-faced panels: 40/0/50

2-mil vinyl-faced panels: 10/0/0

Unfinished-paper faced panels: 15/15/0

Patterns

Unpainted Paper Facing



Natural

Shell

White Textured Coating



Snowdrift







Bone



Adobe



These color reproductions show colors as closely as possible within printing limitations. For exact colors, see actual USG Gypsum Ceiling Panel facing material samples offered by your U.S.G. sales representative.



sound attenuation(1)																				
		size of			sou	nd atte	nuatio	on fact	ors—c	dB										
products & patterns		tile/panel tested	mount	STC		d cente				400	500	620	000	4000	4050	4000	2000	050	0.045	. 4000
ACOUSTONE Tile		tested	ing	310	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	250	0 315	0 4000
"F" Fissured		¾"x12"x12"	Ad(2)	54	37	42	46	43	46	48	49	49	53	57	>60 >	>60	>60	>60	>60	>60
7 7 10001 00		74 112 112	ICF CCF	27 25	24 23	30 28	31 28	23 21	23	22	23 21	23 20	24 22	25 23	27 25	30 26	33	34 31	40	43 39
Glacier		¾"x12"x12"	CCF	24 25	25 24	28 30	29 29	22 22	19 20	19 20	20 22	20 21	22 22	21 23	24 24	27 27	28 29	29 28	31 32	36 36
Foil-Backed ACOUSTONE	Tile and P	anels								,										
"F" Fissured		3/4"x12"x12"	ICF	39	30	37	37	32	32	33	34	35	37	38	41	45	50	52	54	58
		¾"x24"x24"	IEd(3)	45	31	36	36	31	34	36	41	45	48	48	50	55	56	55	57	>60
		3/4"x24"x24"	CE(3)	39	28	34	34	31	30	32	34	36	38	38	40	42	44	45	47	50
Glacier		3/4"x24"x48" 3/4"x12"x12"	CE(3)	39 37	28	34	35 35	30 29	29	33	34	36	38	40 36	38	42	45 47	44	46 50	<u>49</u> 52
	-	3/4"x24"x24"	CE(3)	38	26	34	34	30	29	30	34	36	38	39	40	42	44	44	46	49
0			CEd(3)	45	24	35	34	32	34	38	41	43	47	48	50	50	50	51	55	56
Seacrest Boulder		3/4"x24"x24" 3/4"x24"x24"	CE(3)	37 36	25 24	31	33	27 28	28	30	33	35	38	38	39	41	44	42	42	44
	ile and De		CE(3)	30	24	34	34	20	21	31	34	33	35	3/	38	40	41	40	41	43
*F" Fissured	lle and Pa	%"x12"x12"	CCF	35	26	25	26	20	27	20	21	21	22	24	26	40	45	45	40	50
r rissuleu	_	3/4"x24"x24"	CE	36	26 25	35	36	29	27	29	31	31	33 35	34	36	40	45	45	48	52 48
Glacier		3/4"x24"x24"	CE(3)	39	28	35	35	33	29	32	36	36	38	40	41	43	46	46	47	50
AURATONE Panels							-				-									
Fissured		%"x24"x48"	CE	36	29	36	34	29	29	31	31	34	36	40	43	50	55	54	56	57
			CEa CEd	42 47	30 31	39 39	35 36	30 33	30 35	36 39	40 42	44 46	50 50	56 > 53	>60 > 57			>60 >60	>60 >60	>60 >60
		¾"x24"x48"	CE	42	29	35	37	32	30	34	36	39	42	45	49	50	51	50	51	54
			CEa	46	34	43	40	31	34	39	44	50	55	60 >	>60 >	-60 >	>60 >	-60	>60	>60
Omni Fissured	-	%"x24"x24" %"x24"x48"	CE	39 40	26	35	34	28	28	30	34	36	39	42	44	47	50	49	49	49
Pin-Perforated		%"x24"x48"	CE	39	29	38	37	30 28	30 28	33	34	37	39	44	49	52 49	55 53	55 52	56 52	57 52
Micro-Perforated		3/4"x24"x48"	CE	42	31	37	39	32	31	34	37	40	42	48	51	53	53	53	54	54
Nordic		%"x24"x48"	CE	35	27	34	33	27	25	28	29	30	32	36	41	46	52	52	54	54
Filigree		%"x24"x48"	CE	38	28	34	36	30	29	31	32	34	36	40	44	49	56	56	56	57
Super-E		3/4"x24"x48" 5/8"x24"x48"	CE CE	42	35 29	37	36	31	31	34	36	39	42	46	50	52	58	57	57	60
GLATEX Impact		%"x24"x24"	CE	42 36	26	29 32	32	23	26	32	39	35	40 36	42 39	45 39	48	50 45	49	51 40	52 40
	-	%"x24"x48"	CE	40	29	34	35	28	30	35	35	37	41	41	44	46	48	47	45	46
New Horizons	Aspen	¾"x24"x24"	CE	42	30	30	34	33	32	33	38	39	40	45	51	55	57	57	57	56
	Tahoe	¾"x24"x24"	CE	43	30	31	34	33	32	34	38	39	42	46	51	55	58	57	58	57
(Omni Fiseurod)	Eight/12_ Two/24	%"x24"x48" 5%"x24"x48"	CE	42	33	40 38	36	32	31	34	37	39 41	42	44	47	50 51		51	51	52
		78 824 840	CE	44	33	30	31	32	32	30	30	41	44	4/	40	31	52	52	53	54
AURATONE FIRECODE Pan Fissured	ieis	5/8"x24"x48"	IE	40	20	26	26	21	20	20	25	27	40	4.4	47	F-4	54	E 4	50	50
rissureu		78 X24 X46	CE	40	29 33	36 38	36 37	31 31	29 30	32 33	35 34	37 36	40 40	44	47 49	51 51		54 54	53 54	56 53
Omni Fissured		%"x24"x48"	CE	41	34	40	38	31	30	33	36	38	40	45	49	52	53	54	54	55
Pin-Perforated		%"x24"x48"	CE	41	30	39	37	32	29	33	35	37	40	44	47	49		51	51	51
Nordic Filigree		%"x24"x48" %"x24"x48"	CE CE	41	31	38 40	38	32	30	33	34	36	40	44	47	50 52		51 54	53 55	52 56
i iligiee		78 AZ4 A40	CE	41	32	40	39	32	30	33	35	30	40	43	40	52	34	34	55	30
AURATONE Tile																				
Fissured		5%"x12"x12" 34"x12"x12"	CCF	44	29	36 41	39 40	33	33	37 42	38	41	43	46	50	52	55 56	53	54	55
Omni Fissured		%"x12"x12" 5%"x12"x12"	CCF	45	33	38	40	38	38	38	38	42	49 45	52 47	52	55 53		55 55	56	58
J.IIII T IOUTOU		3/4"x12"x12"	CCF	46	34	38	40	34	36	39	41	43	45	50	51	53		55	56	56
Pin-Perforated		%"x12"x12"	CCF	44	31	34	37	32	33	38	38	41	44	47	50	55		56	56	59
Nordic		5⁄8″x12″x12″	CCF	44	28	37	39	34	33	37	39	41	44	46	49	53		56	56	59
Filigree	-	5/8"x12"x12"	CCF	42	31	33	36	31	33	37	36	39	41	44	48	53		55	54	58
AURATONE FIRECODE Tile		3/4"x12"x12"	CCF	46	32	35	38	34	34	39	40	43	46	50	52	55	57	56	54	58
Fissured		%"x12"x12"	CCF	17	20	20	40	25	25	12	41	12	17	49	52	55	50	57	57	59
1 ISSUIEU		3/4"x12"x12"	CCF	47	29 31	38 41	40 39	35	35	43 39	41	43	47	50	53	54		57 54	57 58	60
Omni Fissured		5/8"x12"x12"	CCF	44	34	38	40	34	34	37	37	41	43	46	50	52		54	56	56
Filigree		5/8"x12"x12"	CCF	40	30	35	36	30	30	32	34	36	40	41	46	52		54	55	60
USG Gypsum Ceiling Panels																				
regular (unpainted)		½"x24"x48"	CE CE	43	34	40	41	34	36	40	41	42	44			48		44 42	41	41
FIRECODE (unpainted)			CE	45	32	42	42	37	38	44	43	45	47	48	50	50	49	42	41	41

⁽¹⁾ All surfaces tested were painted. Sound Transmission Class values were derived by test at recognized independent laboratories according to AMA 1-II procedure, except New Horizons Series AURATONE Panels which were tested at U.S.G. Research facilities. Mounting of ceiling tile/panel test specimens is coded in the table as a two-or three-letter abbreviation for the type of suspension grid.

Abbreviation 1st letter: Ad—Adhesive attachment, C—Continuous at partions. I—Interrupted at partitions. 2nd letter: C—Concealed suspension system, E—Exposed

suspension system. 3rd or 4th letter: F—Flat splines. T—Tee splines. X—accessible feature, a—one layer 1½" THERMAFIBER Sound Attenuation Blankets, laid on ceiling continuous. d—two layers 1½" THERMAFIBER Sound Attenuation Blankets laid on ceiling, 4 ft wide on each side of partition.

(2) Tile adhesively attached to ½" gypsum panels screw-attached to indirect hung suspension, and interrupted at partition.

(3) Shadow Line edge configuration.

Accessories for Fire-rated/Insulated ACOUSTONE and AURATONE Acoustical Panel/Tile Ceilings

- Light Fixture Protection—for fire-rated ceilings
- Ceiling Overlaid Insulation—for high sound attenuation

THERMAFIBER Light Fixture Protection comes conveniently packaged for use with fire-rated ceilings. It consists of 1¼-in. thick semi-rigid mineral-wool board for assembly and suspension over standard-size fixtures. Available UL labels cover ceiling ratings of 1, 1½, 2 and 3 hours. Each package contains board material for one of two-types: box assembly, factory-cut for tile ceilings and concealed suspension; tent assembly, field-cut for panels in exposed grids.

Auratone Firecode Panel Light Fixture Protection can be field-fabricated from standard ½x24x48-in. Auratone Firecode Panels, and qualifies for use in certain fire-rated floor/ceiling assemblies, in lieu of Thermafiber Light Fixture Protection. Included among these assemblies are UL Design Nos. G228, G231, J202 and L206, described on pages 32-33.

Sound-insulated Ceilings—reduced flanking sound improves partition performance

THERMAFIBER Sound Attenuation Blankets significantly reduce sound transmission over partitions when they are overlaid on exposed-grid ceilings of ACOUSTONE OF AURATONE Panels.

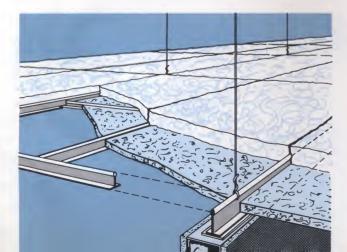
Paperless, semi-rigid mats of spun mineral-fiber, these sound attenuation blankets trap sound energy in millions of air pockets. Laid in one layer over the entire ceiling, or in a double layer only for a 4-ft. distance along each side of a partition, they increase the sound attenuation of acoustical ceilings and greatly improve attenuation of flanking sound over partitions. Thermafiber Sound Attenuation Blankets are 1½x24x48-in.; blanket thermal resistance (R) is 5.75, weight 0.37 lb/ft².

Limitations—Do not overlay insulation on: (1) ceiling panels where high humidity can occur (it may cause objectionable panel sag), (2) fire-rated ceilings (it nullifies the rating of UL Designs). To prevent objectionable panel sag in cases of standard occupancy conditions, limit overlaid insulation to 0.75 lb/ft² maximum. (For complete limitations of Acoustone and Auratone ceilings, see pages 7 and 14, respectively.)

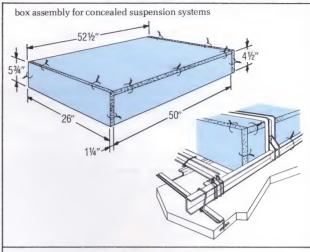
Overlaid Insulation for high-sound attenuation ceilings

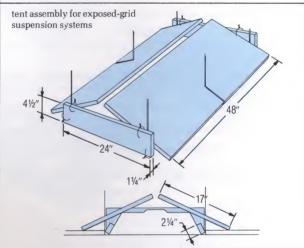
Mounting CEa—STC's in the 40-49 range with 2x4-ft. Fissured AURATONE Panel ceilings (see page 30 for 16-frequency test results).

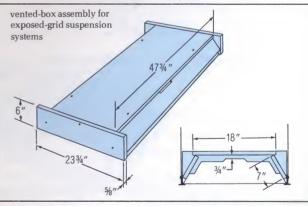
Mounting CEd—STC's in the 45-49 range with 2x2-ft. Glacier ACOUSTONE Panel or 2x4-ft. Fissured AURATONE Panel ceilings (see page 30 for 16-frequency test results).

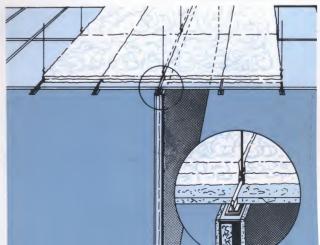


Light Fixture Protection for fire-rated ceilings



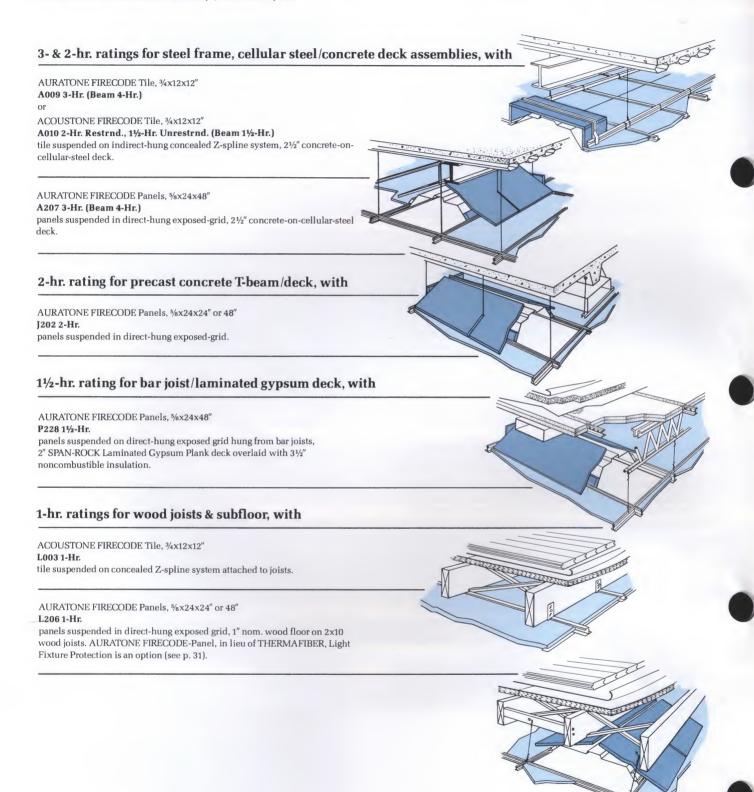






UL Designs for fire-rated requirements with:

- AURATONE FIRECODE Tile, 3/4x12x12"
- ACOUSTONE FIRECODE Tile, 3/4x12x12"
- AURATONE FIRECODE Panels, %x24x24", 48"



UL Designs for fire-rated requirements with:

- ACOUSTONE FIRECODE Tile, 3/4x12x12"
- AURATONE FIRECODE Tile, %x12x12", 24x24"
- ACOUSTONE FIRECODE Panels, 3/4x24x24"
- AURATONE FIRECODE Panels, %x24x24", 48"; 5% or 3/4x20x60", 24x24" to 30x60"
- USG Gypsum Ceiling Panels, 1/2x24x24", 48"

2-& 11/2-hr. ratings for riblath/concrete deck-on-bar joist assemblies, with

ACOUSTONE FIRECODE Tile, ¾x12x12"

G018 2-Hr., G020 11/2-Hr.

tile suspended on concealed Z-spline system hung from bar joists, $2\frac{1}{2}$ " (G018) or 2" (G020) concrete deck.

AURATONE FIRECODE Tile, 5/8x12x12" or 24x24"

G008 2-Hr. (Beam 2-Hr.)

tile suspended on concealed accessible system hung from bar joists, $21\!/\!2''$ concrete deck.

AURATONE FIRECODE Tile, %x12x12"

G019 2-Hr.

tile suspended on concealed Z-spline system hung from bar joists, $2\frac{1}{2}$ " concrete deck.

ACOUSTONE FIRECODE Panels, 3/4x24x24"

G228 2-Hr. (Beam 2-Hr.)

panels with Shadow Line (rabbeted) edge suspended in direct-hung exposed grid, hung from bar joists, 2½" concrete deck. AURATONE FIRECODE-Panel, in lieu of THERMAFIBER, Light Fixture Protection is an option (see p. 31).

AURATONE FIRECODE Panels, 5/8x24x24" or 48"

G211 2-Hr., G227 2-Hr. (Beam 3-Hr.), G251 2-Hr. (Beam 2-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists, 2½" concrete deck. G251 excludes %x24x24" size. Shadow Line (rabbeted) edge approved for G227.

AURATONE FIRECODE Panels, $\frac{5}{4}$ or $\frac{4}{4}$ x20x60", 24x24" to 30x60" (except $\frac{5}{4}$ x30x60")

G231 2-Hr. (Beam 3-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists, $2\frac{1}{2}$ concrete deck.

USG FIRECODE Gypsum Ceiling Panels, 1/2x24x24"

G222 2-Hr. (Beam 2-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists, $2\frac{1}{2}$ " concrete deck.

USG FIRECODE Gypsum Ceiling Panels, 1/2x24x48"

G259 11/2-Hr. (Beam 11/2-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists, $2\frac{1}{2}$ concrete deck.

11/2- & 1-hr. ratings for steel deck-on-bar joist assemblies, with

AURATONE FIRECODE Panels, 5/8x24x48"

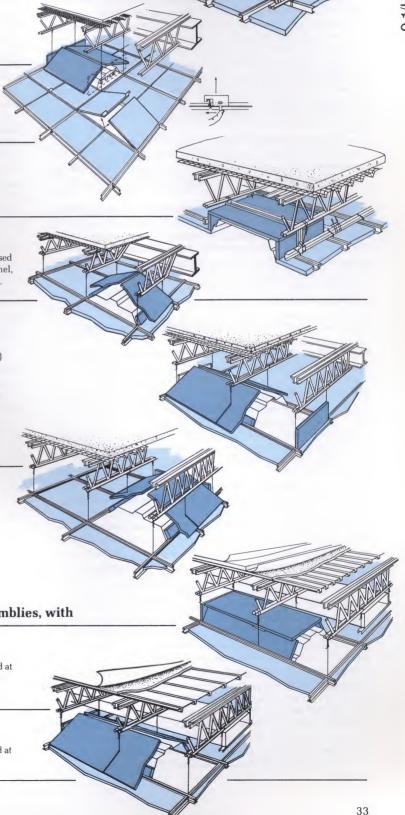
P233 11/2-Hr. (Unrestrnd. 1-Hr.)

panels suspended in direct-hung exposed grid hung from bar joists spaced at 4'0" o.c., 1" steel deck overlaid with 1 layer of gypsum drywall panels and minimum of 1" mineral fiber insulation (no maximum).

AURATONE FIRECODE Panels, %x24x48"

P214 1-Hr.

panels suspended in direct-hung exposed grid hung from bar joists spaced at 6'0'' o.c., $1\frac{1}{2}$ " steel deck overlaid with 1" noncombustible insulation.



Good design practices

- 1. System performance—U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.
- **2. Layouts**—Many acoustical contractors will arrange for job layouts and detailing; however, architects may prefer to furnish the layouts.
- 3. Occupancy conditions—U.S.G. acoustical products are designed for installation and use under standard conditions of temperature and humidity. See "limitations", pages 7, 14, 23, 24-25, 28, 29 and 31, for detailed use and installation precautions for the respective product lines.
- 4. Storage conditions—Ceiling material storage time at the jobsite should be as short as possible, and environmental conditions should be as near as possible to those specified for occupancy (see no. 3 above). For longer-than-normal storage, cartons should be removed from pallets and stringers to prevent distortion of material. Long-term storage under uncontrolled environmental conditions should be avoided: excess humidity during storage can cause expansion of material and possible warp, sag or poor fit after installation; chemical changes in the mat and/or coatings can be aggravated by excess humidity and cause discoloration during storage, even in unopened cartons.
- 5. Insulation—The roof deck above U.S.G. acoustical ceiling products must be properly insulated and incorporate a vapor retarder to prevent condensation and staining of the ceiling. Insulation blankets can be overlaid on the ceiling, but under some conditions can cause objectionable panel sag—and always will if too heavy. And the space above must always be adequately ventilated. In addition, overlaid material of any kind inhibits access through the ceiling, and usually nullifies an assembly's fire rating (see "limitations" in the specific product section, pages 7, 14, 23, 24-25, 28, 29 or 31).
- **6. Pattern direction**—With directional patterns such as "F" Fissured, orientation of fissures relative to light source should be carefully considered for desired visual effect, and specified accordingly. However, when direction of light is at a critical low angle of incidence with ceiling plane, edge appearance problems are minimized when fissure and light directions are parallel.
- 7. Critical lighting—Strong sidelighting with slight angle of incidence to ceiling surface, greatly exaggerates surface irregularities. It demands careful, precise installation to avoid job problems and owner complaints, therefore should be avoided if possible. Effects can be minimized by using beveled-edge or rough-surfaced patterns in lieu of smooth-surfaced or square-edge units, or by employing exposed suspension. Shadows often can be eliminated or softened with draperies or blinds.
- **8. Handling**—Because acoustical ceiling materials are fragile, rough handling can easily chip edges or break units. Cartons never should be used as scaffolding or a substitute for a ladder.
- 9. Concealed spline systems—They present the most nearly monolithic ceiling appearance. Four-sided spline support levels the tile, acts as an air seal. These systems provide slight adjustment to compensate for job inaccuracies. They can provide accessibility above, but square-edge tile is not recommended for frequent removal.

- 10. Humidity variation—Between installation and use of tile on rigid concealed-grid suspension systems, humidity can cause expansion-contraction problems with the tile. See "limitations", pages 7 and 14 for detailed precautions for the respective product lines.
- 11. Exposed grid systems—With lay-in panels, these provide access above the ceiling, and a choice of surface treatment with various edge configurations; square edge for flush installation or Shadow Line for recessed-grid effect. In exterior or fire-rated applications, only suspension systems so rated may be used.
- 12. Direct-staple attachment—With existing drywall ceilings, this is the easiest, most economical method, requiring only that the existing ceiling be minimum ½ in. thick and in a flat plane without bumps or ridges. Double stapling with ‰ in. long divergent-point staples is recommended.
- 13. Adhesive attachment—With existing drywall ceilings, this method, using an adhesive in accordance with ASTM D1779-65 or Federal Spec. MMM-A-00150B (GSA-FSS) is preferred where the existing ceiling is not flat enough for direct stapling.
- 14. Maintenance—General cleaning, for loose dust, is handled with a soft brush or vacuum cleaner. Brushing should be light and in only one direction. Small marks and smudges can usually be removed with "art gum" eraser. New wallpaper cleaner is often used for larger soiled areas. For small nicks and chips a small amount of paint, chalk or pastel of matching color is excellent for hiding and "filling." For the white color, typists' correction fluid, or shoe polish is satisfactory. A trial should be made on a scrap tile.

Soiled acoustical tile and panels can be washed with mild soapsuds, but not detergent, and should never be soaked or immersed. A soft washcloth, soaked and wrung dry is best, both for washing lightly and for clear-water rinse. Tile adhesively applied should not be washed until 4 hours later.

Ceiling units can be repainted without loss of acoustical properties if a thin, non-bridging, vinyl-acrylic flat wall paint is used (such as TAL Latex Wall Paint from U.S.G.). Plastic-coated tile/panels should be repainted with TAL Latex, or other properly formulated vinyl-acrylic semi-gloss enamel to retain the original semi-gloss appearance. Paint should be chosen also for good hiding power. Spraying is preferable, but ACOUSTONE products and USG Gypsum Ceiling Panels also can be brush- or roller-painted. If possible, units should be removed from ceiling for painting. 15. Dimensions—Product standards are based upon performance ratings, not dimensional minimums. In accordance with industry practice, all acoustical ceiling product dimensions are nominal. 16. Color/texture uniformity—Variations in color and fissure size in acoustical ceiling products are natural; they are of small consequence within a batch, but more obvious from batch-to-batch. Jobs should be planned so that material is ordered and shipped at

Architectural specifications

Part 1: general

1.1 scope—Specify areas to receive this acoustical treatment.

1.2 qualifications

Construction conditions shall comply with ASTM C636. Acoustical material and suspension systems, including all necessary hangers, grillage, splines and supporting hardware, shall be furnished and installed by an acoustical contractor.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises. Immediately prior to installation, tile and panels shall be stored for a sufficient time to stabilize at temperature and humidity conditions ambient during installation, and anticipated for occupancy.

1.4 environmental conditions

Installation of (acoustical tile or panels shall not begin until building is enclosed, permanent heating and cooling equipment in operation, and residual moisture from plaster, concrete or terrazzo work dissipated.) (USG Exterior Gypsum Panels shall not begin until protection from direct exposure to water and weather has been provided.)

1.5 design conditions

System shall be rated NRC () in accordance with ASTM C423 and STC () in accordance with AMA 1-II as tested by an independent agency.

Part 2: products

2.1 materials

- **2.1.1 ACOUSTONE Mineral Acoustical Tile** by United States Gypsum, ("F" Fissured) (Glacier) (Seacrest) (Boulder) pattern, () color, ¾" thick, (length x width), (bevel) (square) edge, molded mineral fiber units having natural fissured surface, 18 lb/ft³ min. density, with (non-breathing factory-applied aluminum foil backing,) (factory-applied plastic surface coating).
- 2.1.2 Foil-Backed Acoustone (Firecode) Mineral Acoustical (Tile) (Panels) by United States Gypsum, (approved for UL Design No.[]), () pattern, () color, ¾" thick, (12"x12") (24"x24"), (square) (bevel) (Shadow Line) edge, with factory-applied non-breathing aluminum foil backing, 18 lb/ft³ min. density, (and factory-applied plastic surface coating).
- **2.1.3** ACOUSTONE Mineral Acoustical Space Units by United States Gypsum, (Finesse) (Glacier) pattern, white color, 21/4" thick, 101/2"×101/2", 18 lb/ft³ min. density.
- 2.1.4 AURATONE Acoustical Tile by United States Gypsum, (Fissured) (Omni Fissured) (Pin-Perforated) (Nordic) (Filigree) pattern, () color, (%") (5%") (3%") thick, (length x width), (staple flange) (butt bevel) (bevel with kerf) (24"x24" Shadow Line) edge, mineral fiber ceiling tile, (factory-applied plastic surface coating).
- 2.1.5 AURATONE Acoustical Panels by United States Gypsum, (Fissured) (Omni Fissured) (Pin-Perforated) (Nordic) (Filigree) pattern, () color, (%") (%") thick, (length x width), (square-cut) (Shadow Line) edge, mineral fiber ceiling panels, (factory-applied plastic surface coating).

- 2.1.6 GLATEX AURATONE (FIRECODE) Impact Acoustical Ceiling Panels by United States Gypsum, mineral fiber of (23.0) (23.4) lb/ft³ density, Gardner Impact-Tested to 20-25 in-lb without visible damage, Ball Hardness Tested (ASTM C367) to (225) (155) lb for ¼-in. depression by a 2-in. steel ball, (approved for UL Design No. [],) White color, ¼ in. thick, (24x24") (24x48"), square edge (, factory-applied plastic surface coating) (; Position Control Clips attached to suspension grid, 2 retaining each panel).
- **2.1.7** Auratone (Firecode) Illusion Ceiling Series Acoustical Panels by United States Gypsum, (approved for UL Design No. []), (Omni Fissured) (Aspen) (Tahoe) perforation pattern with edge rabbeted and face routed to (Eight/12 pattern, 24x48" panel) (Two/24 pattern, 24x48" panel) (Four/48 pattern, 24x48" panel) (Three/20 pattern, 20x60" panel), 5%" thick, () color, mineral fiber ceiling panels, (, factory-applied plastic surface coating).
- **2.1.8 AURATONE New Horizons Series Ceiling Panels**, by United States Gypsum, (Aspen) (Tahoe) (Teton) (Cascade) pattern, () color, (%") (¾") thick, (24x24"), (24x48"), (square-cut) (Shadow Line) edge (, factory-applied plastic surface coating).
- **2.1.9 AURATONE Super-E Adverse Environment Panels** by United States Gypsum, mineral fiber panels face- and back-laminated to aluminum foil, Micro-Perforated pattern, stippled White color, (%") thick, (24x48") (48x48"), square-cut edge.
- **2.1.10 AURATONE FIRECODE Acoustical Tile** by United States Gypsum, approved for UL Design No. (), (Fissured) (Omni Fissured) Pin-Perforated) (Nordic) (Filigree) pattern, () color, (5%") (34") thick, (12"x12") (12"x24") (24"x24"), (bevel) (square) edge, (factory-applied plastic surface coating).
- **2.1.11 AURATONE FIRECODE Acoustical Panels** by United States Gypsum, approved for UL Design No. (), (Fissured) (Omni Fissured) (Pin-Perforated) (Nordic) (Filigree) pattern, () color, 5%" thick, (length x width), (factory-applied plastic surface coating).
- **2.1.12 VISTA SONIC Mirrored Ceiling Panels** by United States Gypsum, ¹⁵/₁₆" thick, (24"x24") (24"x48"), tinted (silver) (gold) (bronze) (black)-reflective.
- **2.1.13 USG (FIRECODE) Interior Gypsum Ceiling Panels** by United States Gypsum, (approved for UL Design No. [G222] [G259]) ([unpainted] [texture-painted [] pattern]) (faced with vinyl, [2-mil] [6-mil] thickness, [] color, [] pattern), nom. ½" thick, (24"x24") (24"x28").
- **2.1.14 USG (FIRECODE) Exterior Gypsum Ceiling Panels** by United States Gypsum (unpainted) (texture-painted [] pattern) (faced with vinyl, [2-mil] [6-mil] thickness, [] color, [] pattern), nom. ½" thick, (24"x24") (24"x48").
- **2.1.15 THERMAFIBER Light Fixture Protection** by United States Gypsum, approved for UL Design No. (), (box) (tent) type assembly, nom. 1½" thick, semi-rigid mineral fiber board.
- **2.1.16 Auratone Light Fixture Protection** by United States Gypsum, field-fabricated to UL Design requirements from standard Auratone Firecode Panels, %"x2'x4' size.
- **2.1.17 fire-rated suspension**—Per UL Design No. () and ASTM C635.
- **2.1.18 concealed suspension**—commercially available system meeting ASTM C635. Flat metal splines engage adjacent tile.

- 2.1.19 one-way exposed spline suspension (48")—Commercially available suspension system meeting "intermediate" (or better) structural standards of ASTM C635, having main member exposed, supporting acoustical tile on all four sides using appropriate angle or tee splines between adjacent tile.
- 2.1.20 exposed grid (Shadow Line) suspension—Inverted tee. direct hung system meeting "intermediate" (or better) structural standards of ASTM C635.
- 2.1.21 concealed accessible (shiplap) suspension—11/4" Z-runner spaced 24" o.c., attached to 11/2" channel grillage. Back-toback angle splines engage adjacent tile to provide ()% accessibility to plenum. Tee and angle splines support remaining tile.

Part 3: execution

- 3.1 suspension system—Install acoustical material and suspension system, including necessary hangers, grillage, splines and other supporting hardware, in accordance with UL Design No. () and ASTM C636.
- 3.2 adhesive—Apply acoustical material, using an adhesive manufactured specifically for applying acoustical tile, in accordance with adhesive manufacturer's directions. Insert fiber splines in kerfs at corners of units.
- 3.3 "F" Fissured Acoustone Tile—Intermix tile from four or more cartons to obtain uniform distribution of fissure variations.
- 3.4 ACOUSTONE Space Units—Install Space Units with Spin-on Wall Clip attached with suitable fasteners to wall.

- 3.5 The Illusion Ceiling Series exposed-grid suspension— Inverted tee, exposed surfaces having low-gloss finish and color of The Illusion Ceiling Series (AURATONE) (AURATONE FIRECODE) Panels, direct-hung system meeting "intermediate" (or better) structural standards of ASTM C635.
- 3.6 fire-rated suspension—Per UL Design No. () and ASTM
- 3.7 light fixture protection—Install (THERMAFIBER) (AURATONE) Light Fixture Protection, and necessary hangers and ties, in accordance with UL Design No. () and ASTM C635.

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Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

U.S.G. Sales Offices: Arizona: Phoenix, (602) 269-5665 • California: Fremont (415) 792-4400; Glendale, (213) 956-1882 • Colorado: Denver, (303) 744-7008 • Florida: Jacksonville, (904) 764-3293; Miami, (305) 949-3436 • Georgia: Atlanta, (404) 393-0770 • Hawaii: Honolulu, (808) 538-7712 ● Illinois: Chicago, (312) 321-4000 ● Indiana: Indianapolis, (317) 848-1513 • Kansas: Prairie Village, (913) 362-0503 • Kentucky: Louisville, (502) 897-2529 • Louisiana: New Orleans, (504) 241-2020 • Maryland: Baltimore, (301) 355-2200 • Massachusetts: Charlestown, (617) 241-8530 • Michigan: Grand Rapids, (616) 942-8870; Southfield, (313) 569-1900 • Minnesota: Minneapolis, (612) 835-4626 Missouri: St. Louis, (314) 872-9172 Nebraska: Omaha, (402) 333-5204 • New York: Albany, (518) 458-7437; Oakfield, (716) 948-5081; Stony Point, (914) 786-2820; Tarrytown, (914) 332-0800 • North Carolina: Charlotte, (704) 332-5023 • Ohio: Chesterland, (216) 729-1957; Cincinnati, (513) 771-3215; Columbus, (614) 451-7710 ● Pennsylvania: Philadelphia, (215) 724-4552; Pittsburgh, (412) 341-0364 ● Tennessee: Nashville, (615) 254-0622 • Texas: Dallas, (214) 357-6277 • Utah: Salt Lake City, (801) 359-3751 • Virginia: Norfolk, (804) 461-1332; Richmond, (804) 285-7528 • Washington: Bellevue, (206) 455-2595 ● Wisconsin: Milwaukee, (414) 375-3111 ● International Div.: Chicago, IL (312) 321-5837.

Veneer Plaster and Steel Framing

system folder SA-912

partition applications

fire	fire-rated construction	acous	stical performance	
rating	description & test no.	STC	description & test no.	
1 hr.	Steel Stud—½" IMPERIAL FIRECODE "C" gypsum base and veneer finish—2½" USG studs—base screw att—joints stag and taped—1/16" veneer finish—perimeter caulked—stud spacing at 16" recommended—GA-WP-1240 wt 8 width 3%"	45	Based on 3%" studs 24" o.c. with 1" sound atten. blankets in cavity— CK-664-1	Α
2 hr.	Steel Stud—2 layers %" IMPERIAL FIRECODE gypsum base and veneer finish—2½" or 3%" USG studs 24" o.c.—base layer screw att—face layer lamin or screw att—joints taped—1/16" veneer finish— UL Des U411 wt 12 width 6%"	47 51	Based on $2\frac{1}{2}$ " studs— TL-75-73 Based on $2\frac{1}{2}$ " studs and $1\frac{1}{2}$ " sound attenblankets in cavity— TL-75-70	В
2 hr.	Steel Stud—2 layers ½" IMPERIAL FIRECODE "C" gypsum base and veneer finish—2½" USG studs 24" o.c.—both layers appl vert, joints stag and screw att—1/16" veneer finish—perim caulked—UL Des U424 wt 10 width 4¾"	53	Based on assembly with 1" sound atten. blankets in cavity—CK-654-66	С
2 hr.	Steel Stud—2 layers ½" IMPERIAL FIRECODE "C" gypsum base and veneer finish—2½" or 3%" USG studs 24" o.c.—2" THERMAFIBER sound atten bikts stapled one side—base appl vert and joint stag—base layer screw att—face layer strip lamin or screw att—joints taped—1/16" veneer finish—perimeter caulked—rating based on assembly with or without sound atten blankets—UL Des U412 wt 10 width 4¾"	49	Field Test—based on 2½" studs and face layer strip laminated—KSO-1090072-a	D
3 hr.	Steel Stud—3 layers ½" IMPERIAL FIRECODE "C" gypsum base and veneer finish—15%" USG studs 24" o.c.—base layers appl vert—face layer appl horiz—base screw-att with joints stag —¹/16" veneer finish—rating based on assembly with or without sound atten blankets— UL Des U435 wt 15 width 45%"	N/A		Е
4 hr.	Steel Stud—4 layers ½" IMPERIAL FIRECODE "C" gypsum base and veneer finish—15;" USG studs 24" o.c.—base layers appl vert—face layer appl horiz—base screw-att with joints stag—1/he" veneer finish—rating based on assembly with or without sound atten blankets— UL Des U435 wt 17 width 55%"	58	Based on assembly with 1½" sound atten, blankets in cavity—SA-820518	F
ceiling a	pplications			
fire	fire-rated construction	acous	stical performance	
rating	description & test no.	STC	IIC description & test no.	
1½ hr.	%" IMPERIAL FIRECODE "C" gypsum base and veneer finish ceiling—susp grid with main run 4' o.c. and cross tees 2' o.c.—base screw-att below grid—joints stag and taped—min 1" roof insul and %" gypsum bd on stl deck over bar joists—1 hr. rating based on assembly with \(\frac{\psi}{2} \) thick base—UL Des P510	N/A		G

beam applications

UL Des G515

(beam

2 hr.)

3 hr.

(beam 3 hr.)

fire	fire-rated construction	beam				
rating	description & test no.	type	comments			
2 hr. (beam only)	Gypsum Base and Veneer Finish Fireprfg—15%" USG stl run chan brackets 24" o.c. —13%"x'%" corner angles att to chan brackets—dbl layer %" IMPERIAL FIRECODE base att with Type S Screws—met beads on corners—1/16" veneer finish—2½" conc deck on fluted stl flr— UL Des N501—UL Des N502	W8 X24	Design N502 based on 1½" steel runner for corner angles and coped brackets			
3 hr. (beam only)	Gypsum Base and Veneer Finish Caged Beam Fireprfg—1%" USG stl run chan brackets 24" o.c.—7%"x1%" corner angles att to chan brackets—3 layers 5%" IMPERIAL FIRECODE base att with Type S screws—1" 20-ga. hex mesh on bottom over middle layer—met beads on corners—joints taped—1/16" veneer finish—2½" conc deck on fluted stl flr— UL Des N505	W8 X24	Fire rating for restrained assembly; 2-hr. rating for unrestrained assembly			

 $\frac{1}{2}$ IMPERIAL FIRECODE "C" gypsum base and veneer finish ceiling furred or susp—USG met fur chan—base att with screws 12" o.c.—joints taped— $\frac{1}{16}$ " veneer finish— $\frac{2}{2}$ " conc on riblath

%" IMPERIAL FIRECODE "C" gypsum base and veneer finish ceiling—USG met fur chan—base att with 1" Type S screws 12" o.c.—joints exp or taped—1/116" veneer finish—3" conc on

riblath over bar joist-furring channel spacing at 16" o.c. recommended-UL Des G512 clg wt 4

over bar joist—furring channel spacing at 16" o.c. recommended—

USG Steel Stud styles ST and STL will provide above fire and sound ratings.

description

In these systems a veneer application (1/16" to 3/32" thick) of specially formulated, gypsum plaster is applied over IMPERIAL Gypsum Base. Either IMPERIAL Finish or DIAMOND Interior Finish is applied in a single-coat system or IMPERIAL Basecoat is used in a two-coat application as a superior base for IMPERIAL Finish, DIAMOND Interior Finish, RED TOP Finish, gauged lime putty, STRUCTO-GAUGE Gauging Plaster and lime, smooth trowel, or Keenes-lime-sand-float finish.

IMPERIAL Gypsum Base, 4 ft. wide, has a high-strength, high-density core, either regular, FIRECODE or FIRECODE "C" type, covered with special absorption face paper designed for veneer plastering. Versatile IMPERIAL Base, as outlined below, is used with steel or wood studs or metal furring channels to meet design requirements for interior partitions and ceilings; shaft walls; furring and column fireproofing.

1. USG Steel Studs, available in several widths (see Specifications,

page 10), set in steel runners, with 1-layer, ½" thick IMPERIAL FIRECODE "C" Base, screw-attached to ½½" studs 16" o.c. This assembly has a 1-hour fire rating, is suited for interior partitions and corridor walls. With double-layer ½" IMPERIAL FIRECODE "C" Base, attached by means

N/A





UNITED STATES GYPSUM

of Type S Screws to 21/2" or 35/6" studs spaced 24" o.c., a 2-hour fire rating plus sound control suitable for party walls is available. Multilayer 1/2" IMPERIAL FIRECODE "C" Base and veneer plaster assemblies offer 3 and 4-hour fire ratings and 58 STC sound control, yet are much lighter weight and thinner than concrete block. Where added partition width is required, double rows of USG Steel Studs are erected to provide chase walls with up to 203/4" net pipe chase width (see page 6). Up to 4-hour column fire protection is also available (see separate System Folder SA-923).

- 2. Metal Furring Channel—With Foil-Back IMPERIAL Gypsum Base screwed to USG Metal Furring erected 16" o.c. direct to masonry or furred with brackets, this construction provides an excellent vapor retarder and offers significant insulating value as exterior wall furring (see page 8). A 3-hour fire-rated ceiling construction including beam protection is available with 1/8" IMPERIAL FIRECODE "C" Base screwattached to furred or suspended USG Metal Furring channels (see page 8). Z-Furring Channels are also used to mechanically attach THERMAFIBER Z-Furring Insulating Blankets or FOAMULAR Insulation to interior of exterior walls. With 1/2" or 5/8" IMPERIAL Gypsum Base screwattached to these channels, the assembly provides a fully insulated wall at a cost competitive with many non-insulated furred walls.
- 3. USG Steel C-H Studs—IMPERIAL Gypsum Base applied in one or two layers with gypsum liner panels and Steel C-H Studs provides systems with up to 3-hour fire ratings. These are ideally suited for enclosing elevator shafts, stairwells and other vertical shafts in core areas of multi-story buildings (see System Folder SA-922 for Shaft Wall applications.)
- **4. Wood Framing**—IMPERIAL Base may be nail or screw-attached to wood framing where 1 or 2-hour fire protection is needed. With base screw-attached to resilient channels, sound ratings up to 53 STC are obtained. For details refer to U.S.G. System Folder SA-913, Veneer Finish and Wood Framing.

function and utility

IMPERIAL Plaster Systems are designed for interior partitions and ceilings, exterior wall furring or wherever conventional plaster or drywall systems are used. The integrated components offer beautiful, hard surfaces ready for next-day decoration. IMPERIAL Plaster provides approximately 3,000 psi compressive strength.

Durability—The high-strength, abrasion- and crack-resistance of IMPERIAL Plaster offers the durability for high-traffic areas.

Fire Resistance—Noncombustible components provide systems with fire-resistance ratings up to 4 hours (see table, page 1).

Sound Control—The systems offer sound isolation up to 53 STC; ideal for party walls.

Versatility—Adaptable to most dimensions or modules in virtually all buildings, these systems meet normal design and job conditions.

Light Weight—The completed partition systems weigh appreciably less than masonry assemblies of the same thickness.

Economy—Simple, inexpensive components erect quickly at a lower cost than conventional plaster systems.

limitations

- 1. Non-load bearing.
- 2. These assemblies should not be used where exposed to abnormal moisture or excessive humidity or temperature.
- 3. Maximum frame spacing and limiting heights should not be exceeded (see tables below).

maximum frame spacing (1)

base and finish	framing spacing						
assembly	in	mm					
1/2" IMPERIAL Gypsum Base one layer, 1-coat system one layer, 2-coat system two layers, 1 & 2 coat system	16 16 or 24 (2) 24	406 406 or 610 (2) 610					
56" IMPERIAL Gypsum Base one layer, 1-coat system one layer, 2-coat system two layers, 1 & 2 coat system	16 or 24 (2) 24 (2) 24	406 or 610 (2) 610 (2) 610					

⁽¹⁾ For perpendicular or parallel application—perpendicular preferred for maximum strength, parallel application not recommended for ceilings. For fire-rated construction, see test report. (2) 24" spacing requires joint treatment with DURABOND Compound and PERF-A-TAPE Reinforcing Tape.

limiting height—steel stud assemblies(1)

stud designation	stud width	stud spacing	allow. defl.	partition, one layer	partition, two layers	furring, one layer
				Statement Sections		411111
USG Steel St	tuds (ST)					
158ST	15⁄8″	16"	1/240 1/360	9'6"d 8'3"d	10'6"d 9'0"d	8′3″d 7′3″d
		24"	1/240 1/360	8′3″d 7′3″d	8′9″f 8′0″d	7′3″d 6′3″d
212ST	21/2"	16"	1/240 1/360	12'6"d 10'9"d	13'6"d 11'9"d	11'0"d 9'9"d
		24"	1/240 1/360	10'9"d 9'6"d	11'3"f 10'3"d	9′9″d 8′6″d
358ST	35/8"	16"	1/240 1/360	16'0"d 14'0"d	16'9"f 14'9"d	14'6"d 12'9"d
		24"	1/240	13'6"d 12'3"d	13'6"f 13'0"d	12′9″d 11′0″d
400ST	4"	16"	1/240 1/360	17′3″d 15′0″d	17'3"f 15'9"d	15′9″d 13′9″d
		24"	1/240 1/360	14'3"f 13'0"d	14'3"f 13'9"d	13′9″d 12′0″d
600ST	6"	16"	1/240 1/360	20'0"f 20'0"f	20'0"f 20'0"f	20'0"f 18'9"d
		24"	1/240 1/360	16'3"f 16'3"f	16'3"f 16'3"f	16'3"f 16'3"f
USG Steel St	uds (STL)	.,	,	.001	11001
158STL	15/8"	16" & 24"	1/240 1/360	8'0"f 7'0"d	8'0"f 7'9"d	6′9″d 6′0″d
212STL	21/2"	16" & 24"	1/240 1/360	9′9″f 9′3″d	9'9"f 9'9"f	9′0″d 8′0″d
358STL	35/8"	16" & 24"	1/240 1/360	12'0"f 11'9"d	12'0"f 12'0"f	12'0"f 10'6"d
USG Steel St	uds (CW	-	17000	11100	1201	1000
212CWS	21/2"	16"	1/240 1/360	14′0″d 12′3″d	14′9″d 13′0″d	13′0″d 11′6″d
		24"	1/240 1/360	12'3"d 10'9"d	13'0"d 11'3"d	11'6"d 10'0"d
358CWS	35/8"	16"	1/240	18′3″d 16′0″d	19'0"d 16'6"d	17'3"d 15'0"d
		24"	1/240 1/360	16'0"d 14'0"d	16'6"d 14'6"d	15'0"d 13'3"d
400CWS	4"	16"	1/240 1/360	19'6"d 17'3"d	20'3"d 17'9"d	18'9"d 16'3"d
		24"	1/240 1/360	17'3"d 15'0"d	17′9″d 15′6″d	16'3"d 14'3"d
600CWS	6"	16"	1/240 1/360	26'6"d	27′6″d	25'6"d
		24"	1/240 1/360	23'3"d 23'3"d 20'3"d	24'0"d 24'0"d 21'6"d	22'3"d 22'3"d 19'6"d
USG Steel St	uds (SJ	and CS)	1/000	20 0 u	2100	13 0 U
35SJ22	31/2"	16"	1/240 1/360	17′9″d 15′6″d	18'6"d 16'0"d	16′9″d 14′6″d
		24"	1/240 1/360	15'6"d 13'6"d	16'0"d 14'0"d	14'6"d 12'9"d
35SJ20	31/2"	16"	1/240 1/360	18'6"d 16'3"d	19'3"d 16'9"d	17′9″d 15′6″d
		24"	1/240 1/360	16'3"d 14'3"d	16'9"d 14'9"d	15'6"d 13'6"d
362SJ20	35/8"	16".	1/240	19'3"d	19′9″d	18'3"d 16'0"d
		24"	1/360	16′9″d 16′9″d	17'3"d 17'3"d	16'0"d
40SJ20	4"	16"	1/360	14′9″d 20′6″d	15'3"d 21'3"d	14'0"d 19'9"d
		24"	1/360	18'0"d 18'0"d	18'6"d 18'6"d	17'3"d 17'3"d
35CS18	31/2"	16"	1/360	15′9″d 18′6″d	16′3″d 19′3″d	15′0″d 17′9″d
		24"	1/360	16'3"d 16'3"d	16′9″d 16′9″d	15'6"d 15'6"d
			1/360	14'0"d	14′9″d	13′6″d

(1) Limiting height for 1/2" or 5%" thick base and 5 psf uniform load perpendicular to partition or furring. Limiting criteria: d—deflection, f—bending stress. Consult local code authority for limiting criteria.

thickness—steel studs(1)

stud	design (2)		minimum		
style	in	mm	in	mm	gauge(3)
STL	0.0168	0.43	0.0160	0.41	26
ST	0.0188	0.48	0.0179	0.45	25
SJ22	0.0299	0.76	0.0284	0.72	22
CWS	0.0344	0.87	0.0329	0.84	20
SJ20	0.0359	0.91	0.0341	0.87	20
CS18	0.0478	1.21	0.0454	1.15	28

(1) Uncoated steel thickness; meets ASTM A568. Coatings are hot-dipped galvanized per ASTM A525; aluminized per ASTM A463, or 55% aluminum-zinc.(2) Conforms to AISA Specification for the Design of Cold Formed Steel Structural Members, 1980 edition.(3) For information only; refer to limiting height and structural properties table for design data.

technical data/components/details

sound transmission loss-db

		band	band center frequency—Hz															
test no.	method	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	STC
SA-820518	Lab	39	41	46	52	53	56	57	60	61	63	64	65	62	56	55	57	58
TL-75-70	Lab	31	39	42	45	49	51	53	53	54	55	55	52	47	48	51	54	51
CK-654-66	Lab	31	40	44	46	48	52	52	53	53	54	53	53	54	55	57	59	53
KSO-1090072-a	Field	26	29	37	39	45	48	48	49	52	54	55	52	52	53	55	56	49
TL-75-73	Lab	27	31	34	39	41	44	47	49	52	54	54	49	44	47	51	54	47
CK-664-1	Lab	27	32	39	40	42	44	44	46	47	45	45	46	44	44	46	49	45

structural properties—steel studs

	stud designation(1)	I _X —in ⁴	S _X	r _X —in	l _y —in⁴	S _y	$\frac{r_y}{-}$ in
	158ST	0.038	0.044	0.678	0.019	0.023	0.484
	212ST	0.103	0.076	1.012	0.020	0.023	0.480
	358ST 400ST	0.243 0.307	0.125 0.143	1.415 1.544	0.021 0.021	0.024	0.464 0.458
	600ST	0.810	0.143	2.208	0.021	0.024	0.426
Y	158STL	0.032	0.036	0.678	0.013	0.019	0.480
-	212STL	0.083	0.060	1.012	0.013	0.019	0.476
	358STL	0.206	0.105	1.414	0.018	0.021	0.460
XX	212CWS	0.186	0.147	1.005	0.040	0.045	0.472
ب	358CWS	0.441	0.241	1.406	0.045	0.046	0.457
Ÿ	400CWS	0.556	0.275	1.536	0.046	0.046	0.451
	600CWS	1.472	0.487	2.198	0.047	0.047	0.419
	35SJ22	0.405	0.222	1.376	0.070	0.068	0.626
	35SJ20	0.488	0.277	1.373	0.083	0.081	0.623
	362SJ20	0.541	0.293	1.429	0.085	0.082	0.621
	40SJ20	0.673	0.333	1.556	0.091	0.083	0.617
	35CS18	0.482	0.277	1.326	0.040	0.041	0.413

(1) Indicates size, style and gauge (SJ and CS members only): 158—1%"; ST, STL and CWS—stud, SJ—stud-joist; 22—ga. thickness (see table page 2). Yield strength: ST, STL and CWS, 33 ksi; SJ and CS, 40 ksi.

limiting height—chase wall partitions(1)

stud designation	stud width	stud spacing	allow. defl.	one layer	two layer
158ST	15/8"	16″	1/240 1/360	13′3″d 11′6″d	14'6"d 12'9"d
212ST		24"	1/240 1/360	11'6"d 10'0"d	12'6"f 11'0"d
212ST	21/2"	16"	1/240 1/360	17′6″d 15′6″d	19′0″d 16′6″d
		24"	1/240 1/360	15′6″d 13′6″d	16′0″f 14′6″d
358ST	35%"	16"	1/240 1/360	22'9"d 19'9"d	23'6"f 21'3"d
		24"	1/240 1/360	19'3"d 17'3"d	19'3"f 18'6"d
212CWS	21/2"	16"	1/240 1/360	19′3″d 17′0″d	20'6"d 18'0"d
		24"	1/240 1/360	17′0″d 14′9″d	18'0"d 15'9"d

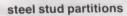
(1) Limiting height for ½" or %" thick base and 5 psf uniform load perpendicular to partition. Use two-layer heights for multi-layer assemblies. Limiting criteria: d—deflection, f—bending stress. Consult local code authority for limiting criteria.

studs 16" o.c.

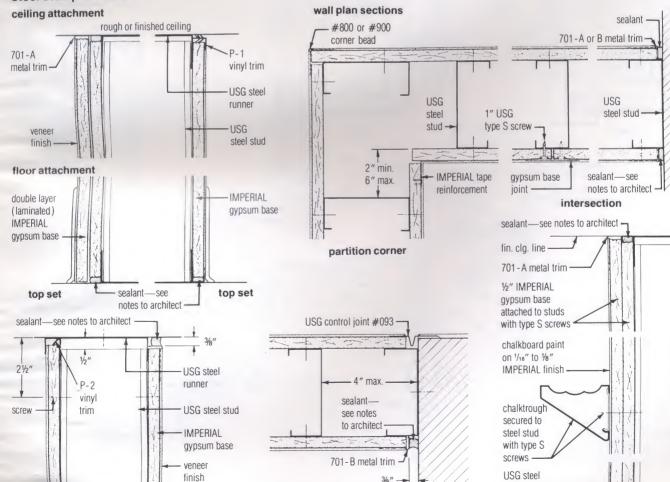
701 - A metal trim

plaster chalkboard

UNITED STATES GYPSUM



perimeter relief ceiling intersection



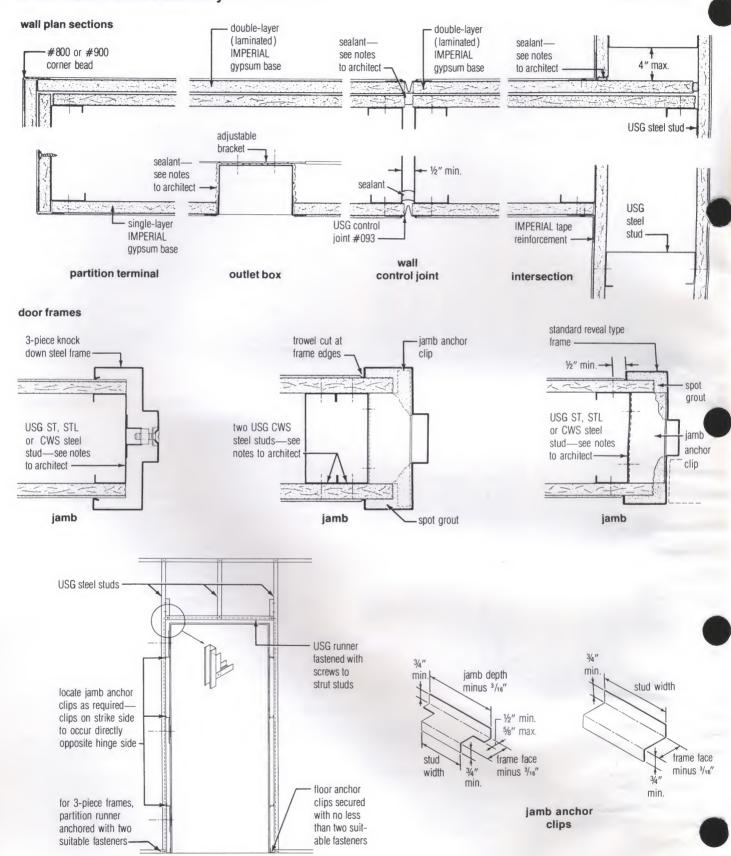
perimeter relief

and control joint

wall or column intersection

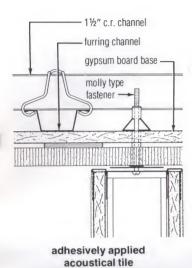
details/steel stud assembly

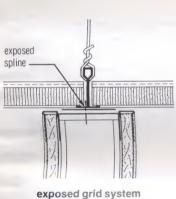
scale: 3'' = 1'-0''



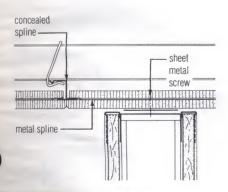
details/steel stud assembly

attachment of partition to ceiling





exposed grid system for acoustical tile & board



concealed grid system for acoustical tile

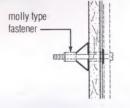
Veneer Plaster and Steel Framing SA-912

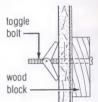
fixture attachment load table

fastener			allow	rable Irawal	allow			
	size			resis	tance	resistance		
type	in	mm	base assembly	lb	N(1)	lb	N(1)	
molly or toggle bolt	1/8 3/16 1/4	3.18 4.76 6.35	½" gypsum base	20 30 40	89 133 178	40 50 60	178 222 267	
	1/8 3/16 1/4	3.18 4.76 6.35	½" gypsum base & ST steel stud	70 80 155	311 356 689	100 125 175	445 556 778	
no. 8 sheet metal screw			1/2" gypsum base & ST steel stud or 25-ga. steel insert	50	222	80	356	
two bolts	3/16	4.76	see grab bar	175	778	200	890	
welded to steel insert	1/4	6.35	attachment below	200	890	250	1112	
oolt welded 1/4 6.35 o 11/2" chan.		see plumber's bracket below	200	890	250	1112		

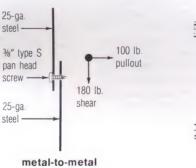
(1) Newtons

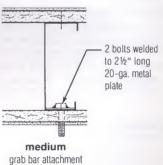
fixture attachments—light

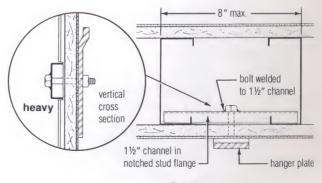












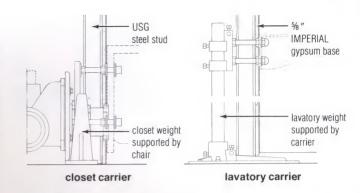
heavy plumbers bracket

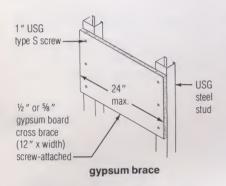
details

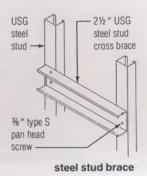
chase walls

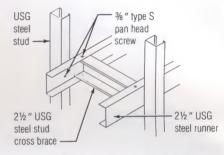
Chase walls, as vertical shafts encasing the usual plumbing supply and wastelines, vent ducts and electrical conduits, require more free space than can be provided within the usual partition assembly.

The steel stud chase wall may be formed of two USG Steel Studs bracketed together with 12" x chase width braces of ½" or ¾" IMPERIAL Gypsum Base. As an alternate, 2½" steel stud cross braces screwattached to chase wall studs may be used. When chase wall studs are not directly opposite, steel stud cross braces 24" o.c. are securely anchored to a continuous horizontal 2½" runner screw-attached to chase wall studs within the cavity. Limiting height for this chase wall is shown on page 2; vertical brace spacing 48" o.c. max.









steel stud & runner brace

furred or suspended ceilings

IMPERIAL Ceiling Systems consist of IMPERIAL Gypsum Base, FIRECODE "C" or regular, screw-attached to USG Metal Furring Channels. These channels are firmly clipped or wire-tied to suspended main runner channels or wire-tied to main support members. USG Type S Screws are used to attach the base to the furring channels. For long span requirements resulting from the location of large ducts or pipes in the ceiling space, the USG Steel Stud may be used as a ceiling furring member in this construction (see table, right).

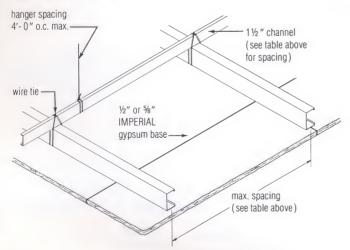
These noncombustible assemblies are designed for interior furred or suspended ceilings or caged beam fireproofing. They serve to conceal and protect structural and mechanical elements with a lightweight fire-resistant ceiling that is highly light reflective when unfinished or is easily decorated and maintained. Perfectly integrated components provide hard surfaces ready for next-day decoration.

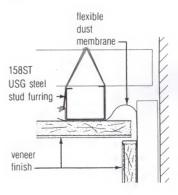
component spacing

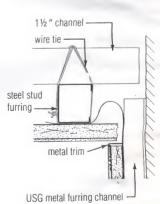
		ceiling	g					
type furring member USG Metal Furring Channel		memb	furring main support member c. to c. spacing control for plaster base thickness of:					
		1/2"	5/8"	1/2"	5/8"	16 ft. ²		
	25-ga.	16"	16"†	4'-0"	4'-0"			
	20-ga.	16"	16"†	8'-5"	8'-5"			
USG Steel Stud	158ST or 158 STL stud erected with both flanges up and against main support member	16"	16"†	5'-0"	5'-0"	16 ft. ²		
	212ST, 212STL	16"	16"†	10'-3"	10'-3"			
	358ST, 358STL	16"	16"†	13'-6"	13'-6"			

†24" spacing may be used with 2-coat plastering.

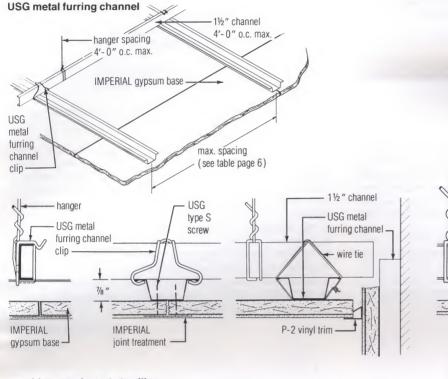
USG steel stud furring

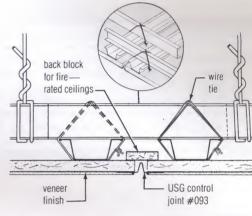


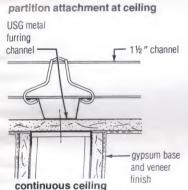


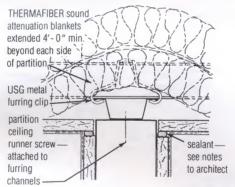


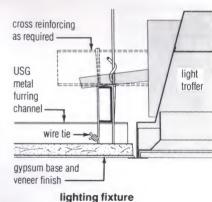
details



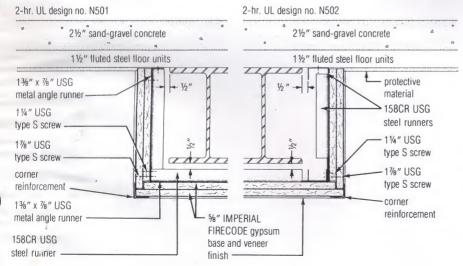




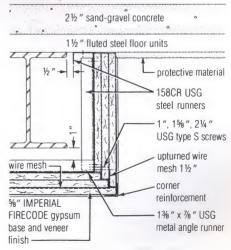




beam protection (beam only)



3-hr. UL design no. N505 (restrained assembly) 2-hr. UL design no. N505 (unrestrained assembly)



exterior wall furring

description	comments	
USG Metal Furring Channels 16" o.c., ν_2 " Foil-Back IMPERIAL gypsum base screw-attached to channels, ν_{16} " veneer finish	Good vapor retarder; no limiting height	A
USG Steel Studs 16" o.c. set in runners, $\%$ " Foil-Back IMPERIAL gypsum base screw-attached to studs, $1/16$ " veneer finish	Free-standing; allows for pipe chase clearance; good vapor retarder	В
USG Z-Furring Channels applied vertically 24" o.c., THERMAFIBER Z-Furring Insulation between channels, 1/2" Foil-Back IMPERIAL gypsum base screw-attached to channels, 1/16" veneer finish	Noncombustible system with mineral fiber insulation; suitable for up to 3" thick insulation; good vapor retarder; no limiting height	С
USG Z-Furring Channels applied vertically 24" o.c., FOAMULAR Extruded Polystyrene Insulation between channels, ½" Foil-Back IMPERIAL gypsum screw-attached to channels. ½" veneer finish	Suitable for up to 2" thick insulation; no limiting height.	D

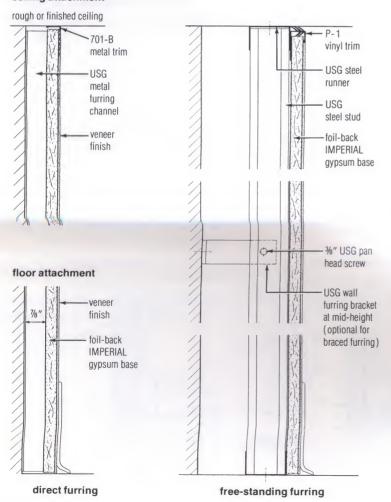
Exterior walls are readily furred using ½" Foil-Back IMPERIAL Gypsum Base screw-attached to steel framing erected vertically. The foil-back base provides an effective, low-cost vapor retarder. IMPERIAL Finish, applied over the gypsum base offers a strong abrasion-resistant interior surface. In these systems, either of three different framing methods may be used to provide a vapor retarder, thermal insulation, and chase space for pipes, conduits and ducts.

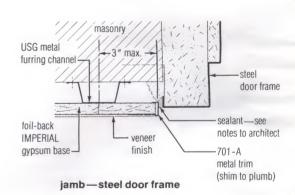
USG Metal Furring Channels, erected vertically 16" or 24" o.c., are fastened directly to exterior walls of monolithic concrete and virtually any type of masonry — brick, concrete block, tile. With Foil-Back IMPERIAL Base screw-attached to channels and $^{1}/_{16}$ " veneer finish applied, this economical system provides an excellent vapor retarder and a durable, easily decorated interior surface.

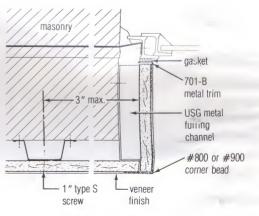
USG Steel Studs are erected vertically between floor and ceiling runners. Foil-Back IMPERIAL Base, screw-attached one side of studs, serves as a superior base for veneer finish application. This free-standing furring system provides maximum clear chase space and minimizes possibilities for photographing or shadowing to occur over fasteners and furring members.

This assembly consists of 1%" stud framing which may be secured to the exterior wall with brackets at mid-height when greater heights are required. The USG Adjustable Wall Furring Bracket is anchored to the exterior wall and attached to each stud web with a %" Type S Pan Head Screw. With the furring bracket, the limiting height is 12 ft. Other furring providing greater height may be constructed with wider or heavier steel studs (see tables, page 2).

ceiling attachment







metal window jamb

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USG Z-Furring Channels mechanically attach THERMAFIBER Z-Furring Blankets or plastic foam insulation to interior of exterior walls. This system provides a self-furring solid backup for Foil-Back IMPERIAL Gypsum Base, screw-attached to the channels. Veneer finishes, applied over the base in one or two coats, offer a strong, abrasion-resistant interior surface.

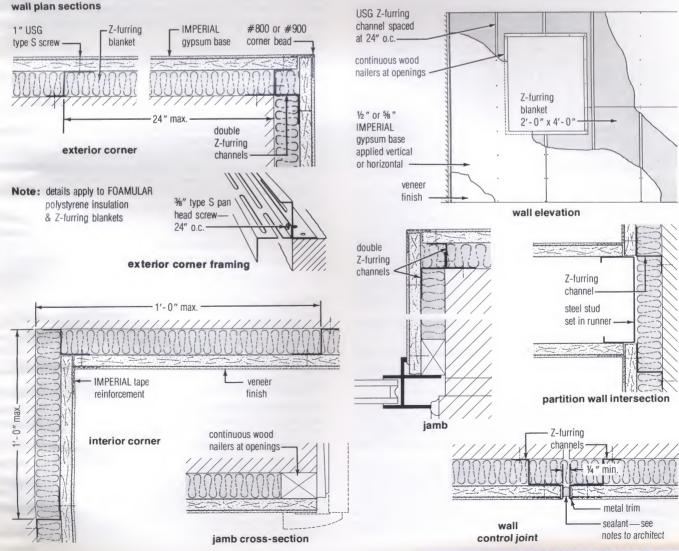
USG Z-Furring Channels, suitable for 1" to 3" thick insulation, are formed from hot-dip galvanized steel for added corrosion resistance.

Fire-resistant Thermafiber Z-Furring Blankets provide a noncombustible assembly and offer low heat transmission. Blankets are a semirigid, spun mineral-fiber mat that meet the requirements for Class A construction. For other applications, Foamular Extruded Polystyrene Insulations offer a range of thicknesses and insulating values. Thermal resistance (R) values for various assemblies are shown below.

design thermal resistance (R) values (1)

				wall insula	ated with						
	nom.		furred wall (2)	THERMAR Z-Furring				FOAMUL/ extruded			
wall construction	wall thickn.	unfin. wall	(no. insul.)	1" (4.17)	1½" (6.00)	2" (8.00)	3″ (12.00)	1" (5.41)	1½" (8.12)	2" (10.82)	3″ (16.23)
4" face brick 8" block	12"	3.01	4.38	7.63	9.46	11.46	15.46	8.87	11.58	14.28	19.69
4" face brick 4" com. brick	8"	2.09	3.46	6.71	8.54	10.54	14.54	7.95	10.66	13.36	18.77
poured conc. 140 lb./cu. ft.	8"	1.49	2.86	6.11	7.94	9.94	13.94	7.35	10.06	12.76	18.17
cinder block	8"	2.57	3.94	7.19	9.02	11.02	15.02	8.43	11.14	13.84	19.25

(1) Resistances based on procedures and design values from 1981 ASHRAE Handbook of Fundamentals, winter conditions (15 mph wind) and neglect the effect of furring channels and fasteners. (2) Interior wall finish: ½" IMPERIAL Base and finish (R-.045). R-values for insulation, shown in parentheses, based on 40°F. mean temperature for FOAMULAR Insulation and 75°F. mean temperature for other insulation and components. R-value for 1" thick FOAMULAR Insulation is 5.0 at 75°F. mean temperature.



specifications

notes to architect

- 1. System Performance—U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.
- 2. Metal door and borrowed-light frames should be at least 16-ga.steel, shop primed, and have throats accurately formed to overall thickness of partition. They should be anchored at floor with 16-ga. steel plates welded in trim flanges, with provision for two power-driven anchors or equal per plate. Jamb anchor clips should be 18-ga. steel welded in jamb (see details, page 4). Stud reinforcing described below is screw-attached to jamb anchor clips. Three-piece frames may also be used with these partitions provided end of partition floor runner is anchored with two suitable fasteners.

For standard doors up to 3'0" wide weighing not more than 100 lb., ST or STL (3%" only) steel studs and runners may be used for framing the opening. For doors 2'8" to 4'0" wide (200 lb. max.) rough framing should be CWS studs (35%" min.) and runners. For heavy doors up to 4'0" wide (300 lb. max.), two CWS studs should be used (see details, page 4). For doors over 4'0" wide, double doors and extra-heavy doors (over 300 lb.), framing should be specially designed to meet load conditions. Rough framing for all doors in fire-rated partitions should be CWS studs and runners.

For added door frame restraint, spot-grouting at the jamb anchor clip is recommended. Spot-grouting is required for solid-core doors and doors over 2'8" wide. Apply DURABOND Joint Compound just before inserting gypsum base into frame; do not terminate base against trim return. Finish should be grooved at frame.

3. Control Joints—Gypsum base surfaces should be isolated with control joints or other means where: (a) partition or furring abuts a structural element (except floor) or dissimilar wall or ceiling; (b) a ceiling abuts a structural element; dissimilar wall or partition or other vertical penetration; (c) construction changes within the plane of the partition or ceiling; (d) partition or furring run exceeds 30'; (e) ceiling dimensions exceed 50' in either direction with perimeter relief, 30' without relief; (f) expansion or control joints occur in the base exterior wall.

Ceiling height door frames may be used as control joints. Lessthan-ceiling height frames should have control joints extending to ceiling from both corners. If control joints are not used, additional reinforcement is required at corners to distribute concentrated stresses.

- 4. Penetrations of the lath-and-plaster diaphragm such as borrowed lights, access panels, light troffers, require additional reinforcement at corners to distribute concentrated stress if a control joint is not used.
- 5. Pipe and Conduit Chases—Additional chases can be provided in steel studs (except in fire-rated construction) by cutting round holes up to 3/4 of stud width, spaced 12" apart.
- 6. Furring Systems—Shallow electrical outlet boxes are recommended when rigid insulation less than 1½" thick is used.
- 7. Fixture Attachment—Lightweight fixtures should be installed with toggle or molly bolts inserted in the base and preferably, also through the stud. Wood or metal mounting strips for cabinets and shelving should be bolted to the stud framing (see details, page 5).
- 8. Ceramic Tile—IMPERIAL Gypsum Base is not recommended as a base for the adhesive application of ceramic and plastic tile and plastic-faced wall panels. SHEETROCK brand W/R Gypsum Panels are recommended for this use (see U.S.G. Product Folder SA-927 in this series of Gypsum Panels).
- 9. Sound tests are conducted under ideal laboratory conditions per ASTM procedures. Comparable field performance depends on building design and careful attention to detailing and workmanship. Where these partitions are used for sound control, USG Acoustical Sealant is recommended to seal the partition perimeter and all cut-outs such as

electrical boxes. Back-to-back penetrations of the diaphragm, flanking paths, door and borrowed-light openings should be avoided.

- 10. Ceilings—Spacing of hangers and channels is designed to support only the dead load. Heavy concentrated loads should be independently supported. To prevent objectional sag in new gypsum base ceilings, the weight of overlaid unsupported insulation should not exceed 1.3 psf for ½" thick base with frame spacing 24" o.c.; 2.2 psf for ½" base on 16" o.c. framing and 5%" base on 24" o.c. framing. Foil-back base or a separate vapor retarder should be installed in all exterior ceilings, and the plenum or attic space vented with a min. ½-sq. in. net free vent area per sq. ft. of horizontal surface.
- 11. Decorating—All finishes applied over IMPERIAL Basecoat must be properly sealed before decorating. IMPERIAL Finish and DIAMOND Interior Finish, if sufficiently dry, may be painted the day after application with acrylic, latex or vinyl breather-type paints. In some markets, DIAMOND Interior Finish is white and may be left undecorated; however, decorating should be specified and may be eliminated later if finished plaster is acceptable.
- 12. Zinc Alloy Accessories—Recommended where corrosion due to high humidity or saline content of aggregate is possible.
- 13. Shadowing—During periods of low outside temperature, condensation may form on exterior walls, collecting airborne dirt to produce photographing or shadowing over fasteners and furring. This is a natural phenomenon which occurs through no fault in the products.
- 14. High-rise Buildings—Variable wind pressure can cause a structure to drift or sway. This can result in movement of the non-load bearing partitions, thus causing noise. United States Gypsum Company assumes no responsibility for the prevention, cause, or repair of these job-related noises.
- **15. WARNING: COMBUSTIBLE.** FOAMULAR Polystyrene Insulation and other rigid foam insulation will ignite if exposed to fire of sufficient heat and intensity. Use only as directed by the specific instructions accompanying the product.
- **16.** Note—United States Gypsum reserves the right to make changes or improvements in the design of all catalogued items without notice and without obligation to incorporate these changes or improvements in items already manufactured.
- 17. Additional Information—See U.S.G. technical folders in this series and in Sweet's General Building File: Construction Selector SA-100 for fire and sound-rated systems; Gypsum Plasters, Bases & Accessories Folder SA-917 for general lathing and plastering specifications; Steel-Framed Drywall Systems SA-923 for column fireproofing description and details; Texture and Paint Product Folder SA-933 for finishing product specifications; Building & Acoustical Insulation Folder SA-705 for insulation specifications; FOAMULAR Insulation Folder SA-710 for data on rigid polystyrene insulation.

Part 1: general

1.1 scope-Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

a. In cold weather, all glazing shall be completed and the building heated to a minimum of 55°F. (13°C) before gypsum base installation. Air circulation shall be kept at a minimum level during veneer plastering until the finish is dry.

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b. When low humidity, high temperatures and rapid drying conditions exist during gypsum base and plaster application, DURABOND Joint Compound and PERF-A-TAPE Reinforcement shall be used on all joints and internal corners and allowed to set and dry thoroughly before plaster application.

Part 2: products

2.1 materials

- a. IMPERIAL Gypsum Base (½") (5½") thick, 48" wide, square edge, (Regular) (Foil-Back) (FIRECODE) (FIRECODE "C").
- b. Laminating Adhesive—DURABOND Joint Compound or USG Ready-Mixed Joint Compound (All Purpose) (Taping) mixed in accordance with manufacturer's directions (for double-layer application).
- c. Fasteners—3/8", 1", 11/4", 15/16", 15/8", 21/4" and 25/8" USG Type S Screws; 11/2" USG Type G Screws.
- d. USG Steel Studs—158ST (15%"), 212ST (2½"), 358ST (35%"), 400ST (4"), 600ST (6"), 158STL (15%"), 212STL (2½"), 358STL (35%"), 212CWS (2½"), 358CWS (35%"), 400CWS (4"), 600CWS (6"), 35SJ22 (3½"), 35SJ20 (3½"), 362SJ20 (35%"), 40SJ20 (4"), 35CS18 (3½"), lengths as required.
- e. USG Steel Runners—158CR (15%'), 212CR (2½'), 358CR (35%'), 400CR (4"), 600CR (6"), 158CRL (15%'), 212CRL (2½'), 358CRL (35%'), 400CRL (4"), 600CRL (6"), 212CWR (2½'), 358CWR (35%'), 400CWR (4"), 600CWR (6"), 35CR22 (3½'), 35CR20 (3½'), 362CR20 (35%'), 40CR20 (4"), 35CR18 (3½").
- f. USG Galvanized Metal Angles, 13/8" x 7/8" x 24-ga.
- g. USG Metal Furring Channel and Clips.
- h. IMPERIAL Tape—(Type P)(Type S) for joint reinforcement.
- i. USG 11/2" Cold-Rolled Channels.
- j. USG Adjustable Wall Furring Bracket.
- k. Accessories—USG (#800)(#900) Corner Bead, (701-A) (701-B) (801-A) (801-B) Metal Trim, (P-1) (P-2) Vinyl Trim, Control Joint #093, 18-ga. Tie Wire, 8-ga. Hanger Wire.
- I. THERMAFIBER (Sound Attenuation) (Z-Furring) Blankets.
- m. FOAMULAR Extruded Polystyrene Insulation (1") (1½") (2") (3") x 24" x 96".
- n. USG Z-Furring Channel (1"), (11/2"), (2"), (3").
- o. USG Acoustical Sealant.
- p. DURABOND Joint Compound and PERF-A-TAPE Reinforcement.

Part 3: execution

3.1 steel stud partition system erection

Attach steel runners at floor and ceiling to structural elements with suitable fasteners located 2" from each end and spaced 24" o.c., or to suspended ceilings with toggle or molly bolts spaced 16" o.c.

Position studs vertically, with open side facing in same direction, engaging floor and ceiling runners, and spaced (16") (24") o.c. When necessary, splice studs with 8" nested lap and one positive attachment per stud flange. Place studs in direct contact with all door frame jambs, abutting partitions, partition corners and existing construction elements. Where studs are installed directly to exterior walls and possibility of water penetration through walls exists, install asphalt felt strips between studs and wall surfaces.

Anchor all studs adjacent to door and window frames, partition intersections, and corners to ceiling and floor runner flanges with USG Metal Lock Fastener tool or screws. Securely anchor studs to jamb and head anchor clips of door or borrowed-light frames by bolt or screw attachment (not required for frames with structural bar struts). Over steel door and borrowed-light frames, place a cut-to-length section of runner, with a web-flange bend at each end, horizontally and secure to strut-studs with two screws in each bent web. Position a cut-to-length stud (extending to the ceiling runner) at the location of vertical joints over door frame header.

3.2 single layer gypsum base erection

Apply gypsum base (parallel to studs) (perpendicular to studs). Position all edges over stud flanges for parallel application; all ends over stud flanges for perpendicular application. To maintain a true surface plane, arrange direction of application so leading edge of base is attached first to open edge of stud flange. Use maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together. Stagger joints on opposite sides of partition. Fasten base to studs with screws spaced 12" o.c. in field of base and along abutting end joints. Screw spacing shown is for non-rated construction. For fire-rated construction, obtain screw spacing from test report.

3.3 double layer gypsum base erection

For screw attachment, space screws 24'' o.c. for base layer and 12'' o.c. for face layer. Apply both layers of gypsum base parallel to studs with joints in face layer offset from base layer joints. For 5%'' base, use 1'' screws for base layer and 15%'' screws for face layer. For 1/2'' base, use 1'' screws for base layer and 15%' screws for face layer.

In double-layer laminated construction, attach base layer with 1" Type S Screws spaced 12" o.c. in field of base and along abutting ends and edges. Apply face layer parallel to studs with specified DURABOND Joint Compound or USG Ready-Mixed Joint Compound spread on back side, joints staggered approx. 12" and fastened to base layer with 1½" Type G Screws. Drive screws approx. 2' from ends and 4' o.c. in field of panel, 1' from ends and 3' o.c. along a line 3" from vertical edges. Screw spacing shown is for non-rated construction. For fire-rated construction, obtain screw spacing from test report.

3.4 chase wall erection

Align two parallel rows of floor and ceiling runners spaced apart as detailed. Attach to concrete slabs with concrete stub nails or power-driven anchors 24" o.c., to suspended ceilings with toggle or molly bolts 16" o.c., or to wood framing with suitable fasteners 24" o.c.

Position steel studs vertically in runners, (16") (24") o.c., with flanges in the same direction, and with studs on opposite sides of chase directly across from each other. Anchor all studs adjacent to door and window frames, partition intersections and corners to floor and ceiling runner flanges with USG Metal Lock Fastener tool or screws.

Cut cross bracing to be placed between rows of studs from gypsum base, 12" high by wall width. Space braces 48" o.c. vertically and attach to stud webs with six Type S Screws per brace. If larger braces are used, space screws 8" o.c. max. on each side. Attach single-layer or base-layer gypsum base with (1") Type S Screws spaced 12" o.c. in field and 8" o.c. staggered at vertical joints.

Bracing of 2½" steel studs may be used in place of gypsum braces. Anchor web at each end of steel brace with two ¾" pan head screws. When chase wall studs are not opposite, install steel stud cross braces 24" o.c. horizontally and securely anchor each end to a continuous horizontal 2½" runner screw-attached to chase wall studs within the cavity.

3.5 ceiling grillage erection

Space 8-ga. hanger wires 48" o.c. along carrying channels and within 6" of ends of carrying-channel runs. In concrete, anchor hangers by attachment to reinforcing steel, by loops embedded at least 2" or by approved inserts. For steel construction, wrap hanger around or through beams or joists.

Install 11½" carrying channels 48" o.c., and within 6" of walls. Position channels for proper ceiling height, level, and secure with hanger wire saddle-tied along channel. Provide 1" clearance between runners and abutting walls and partitions. At channel splices, interlock flanges, overlap ends 12" and secure each end with double-strand 18-ga. tie wire.

Erect metal furring channels at right angles to $1\frac{1}{2}$ " carrying channels or main support members. Space furring (16") (24") o.c. and

within 6" of walls. Provide 1" clearance between furring ends and abutting walls and partitions. Secure furring to carrying channels with clips or saddle-tie to supports with double-strand 18-ga. tie wire. At splices, nest furring channels at least 8" and securely wire-tie each end with double-strand 18-ga. tie wire.

At light troffers or any openings that interrupt the carrying or furring channels, install additional cross reinforcing to restore lateral stability of grillage.

3.6 ceiling panel installation

Apply gypsum base of maximum practical length face down with long dimension perpendicular to furring channels. Position end joints over channel web and stagger in adjacent rows.

Fit ends and edges closely, but not forced together. Fasten base to channels with 1" Type S Screws spaced 12" o.c. in field of base and along abutting ends and edges.

3.7 caged beam fireproofing

Position ceiling runners at least 1/2" from and parallel to beam, and fasten to floor units with 1/2" Type S-12 Pan Head Screws spaced 12" o.c. Fabricate hanger brackets from 15/8" steel runners allowing 1" clearance at bottom of beam. Space brackets 24" o.c. along beam and attach to ceiling runners with 1/2" Type S-12 Screws. Install lower corner runners parallel to beam and fasten to brackets with 1/2" Type

Screw-attach (two) (three) layers of 5/8" IMPERIAL FIRECODE Gypsum Base to channel brackets installing vertical panels first, with bottom panels overlapping lower edges of vertical panels in each layer. Attach panels to channel brackets with (1") (11/4") Type S Screws 16" o.c. for base layer, 15%" Type S Screws 12" o.c. for middle layer and (17/8") (21/4") Type S Screws 8" o.c. for face layer. For 3-hour assembly, install wire mesh over bottom middle-layer panel, extend 11/2" up each side and fasten with 15%" screws used to fasten panels.

3.8 wall furring channel attachment—direct

Attach metal furring channels vertically, spaced (16") (24") o.c., to interior of masonry or concrete surfaces with hammer-set or powerdriven fasteners or concrete stub nails staggered 24" o.c. on opposite flanges. Where furring channel is installed directly to exterior wall and a possibility of water penetration through walls exists, install asphalt felt protection strip between furring channel and wall.

3.9 Z-furring channel attachment

Erect insulation vertically and hold in place with Z-furring channels spaced 24" o.c. Except at exterior corners, attach narrow flanges of furring channels to wall with concrete stub nails or power-driven fasteners spaced 24" o.c. At exterior corners, attach wide flange of furring channel to wall with short flange extending beyond corner. On adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with a standard width insulation panel and continue in regular manner. At interior corners, space second channel no more than 12" from corner and cut insulation to fit. Hold mineral-fiber insulation in place until gypsum base is installed with 10" long staple field-fabricated from 18-ga. tie wire and inserted through slot in channel. Apply wood blocking around window and door openings and as required for attachment and support of fixtures and furnishings.

Apply gypsum base parallel to channels with vertical joints occurring over channels. Use no end joints in single-layer application. Attach gypsum base with 1" Type S Screws spaced 12" o.c. in field of base and at edges, and with 11/4" Type S Screws spaced 12" o.c. at exterior corners. For double-layer application, apply base layer parallel to channels, face layer either perpendicular or parallel to channels with vertical joints offset at least one channel. Attach base layer with screws 24" o.c. and face layer with 15%" screws 12" o.c. Use DURABOND Compound and PERF-A-TAPE Reinforcement on all joints, interior corner trim and corner beads and allow to set and dry thoroughly before veneer finish application.

3.10 accessory application

When low humidity, high temperatures and rapid drying conditions exist, use DURABOND Joint System on all joints and internal corners and allow to set and dry thoroughly before applying veneer finish.

a. Reinforcing Tape—Apply over full length of all gypsum base joints; do not overlap at intersections.

Type P Tape—Firmly press along entire length with steel trowel to insure firm wrinkle-free attachment.

Type S Tape—Apply with spring-driven stapler using 3/8" staples. Use two staples at each end of tape and stagger intermediate staples 24" along length of tape. At wall-ceiling intersections and interior corners, staple tape 24" o.c. along ceiling edge or on one edge only.

- b. Laminating Adhesive—Spread to provide 1/2" adhesive beads 41/2" o.c. for full sheet lamination. For strip lamination, apply adhesive in vertical strips of four 1/2" beads 11/2" to 2" o.c. Space strips 24" o.c.
- c. Corner Bead-Reinforce all vertical and horizontal exterior corners with corner bead fastened with \%16" galvanized staples 12" o.c. on both flanges along entire length of bead.
- d. Casing Bead—Where wall or partition terminates against masonry or other dissimilar material, apply metal trim over gypsum base and fasten with 9/16" galvanized staples 12" o.c.
- e. Screws-Power-drive and set so screwhead is flush with surface of gypsum base without tearing through face paper.
- f. Control Joints-Break gypsum base behind joint and back by double study or furring channels. Attach control joint to gypsum base with screws or %16" galvanized staples spaced 6" o.c. on both flanges along entire joint length.
- g. P-1 Vinyl Trim—Slip trim over gypsum base with long flange behind base. Install base with trim firmly abutting surface
- h. P-2 Vinyl Trim-Provide 1/8" to 3/8" relief for trim at gypsum base angle. Remove protective paper from adhesive on web of trim and insert trim into relief, adhesive against wall surface. Press upward until flange seats against ceiling.

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: DIAMOND, STRUCTO-GAUGE, SHEETROCK, THERMAFIBER, IMPERIAL, DURABOND, PERF-A-TAPE, FIRECODE, USG. FOAMULAR is a trademark of UC Industries

Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.



UNITED

partition applications

fire	fire-rated construction	acoustic	cal performance				
rating	description & test no.	STC	description & test no.				
1 hr. est	Wd Stud—Resil %" IMPERIAL gypsum base & veneer finish—2x4 16" o.c.—2 layers base one side screw att & lamin—single layer opp side screw att to RC-1 chan—3" THERMAFIBER sound atten blkts—1/16" veneer finish both sides—perimeter caulked—est. fire rating based on UL Des U311 width 6\%"	53	CK-654-38	Α			
1 hr.	Wd Stud—Resil %" IMPERIAL FIRECODE "C" gypsum base & veneer finish—2x4 16" o.c.—3" THERMAFIBER sound atten bikts—RC-1 chan one side spaced 24" o.c.—base att with 1" Type S screws—opp side att direct with 11/4" Type W screws—1/16" veneer finish both sides—perimeter caulked— UL Des U311 wt 8 width 51/2"	50† 49	USG-111-FT-G&H Based on ½" gypsum base—CK-664-4	В			
1 hr.	Wd Stud—½" IMPERIAL FIRECODE "C" gypsum base att direct & veneer finish—2x4 16" o.c.—base nailed 7" o.c. 6d nails—½" veneer finish—joints taped— U of C 10-27-64 wt 7 width 4¾"	N/A		С			
1 hr.	Wd Stud—%" IMPERIAL FIRECODE "C" gypsum base & veneer finish—2x4 16" o.c.—base nailed 7" o.c. 1%" cem ctd nails—1/16" veneer finish both sides—joints taped— UL Des U305 wt 7 width 5"	N/A		D			
2 hr.	Wd Stud—2 layers %" IMPERIAL FIRECODE "C" gypsum base & 1/16" veneer finish both sides—2x4 16" o.c.—base layer 6d nails 6" o.c.—face layer 8d nails 8" o.c.—joints taped—UL Des U301 wt 12 width 61/4"	N/A		E			
NOTE: Part	ition widths based on 3%" stud width.	† Based	on 11-freq.				

ceiling applications

fire	fire-rated construction	acoustical performance	
rating	description & test no.	STC IIC description & test no.	-
1 hr.	12" IMPERIAL FIRECODE "C" gypsum base & veneer finish ceiling—2x10 wd joist 16" o.c.— 1" nom wd sub & fin flr—gypsum base att with 5d nails 6" o.c.—1/16" veneer finish—joints taped— UL Des L512 clg wt 3	N/A	F
1 hr.	Resil ½" IMPERIAL FIRECODE "C" gypsum base & veneer finish ceiling—2x10 wd joist 16" o.c. —1" nom wd sub & fin fIr—RC-1 chan spaced 16" o.c. and at end joints—base att with Type S screws 12" o.c.—1/16" veneer finish—joints taped— UL Des L514 clg wt 3	N/A	G
1 hr.	%" IMPERIAL FIRECODE gypsum base & veneer finish ceiling—Amer Plywood Assn 2-4-1 flr 4x10wd joist 48" o.c.—USG met fur chan—base att with 1"Type S screws 12" o.c.—1/18" finish—joints taped—furring channel spacing at 16" o.c. recommended— UL Des L508 clg wt 3	N/A	Н
1 hr.	%" IMPERIAL FIRECODE gypsum base & veneer finish ceiling—1" nom wd sub & fin fIr—2x10 wd joist 16" o.c.—base att with 6d nails 6" o.c.—1/16" veneer finish—joints taped— UL Des L501 clg wt 3	N/A	ı
1 hr.	%" IMPERIAL FIRECODE gypsum base & veneer finish ceiling—2x12 wd truss 24" o.c.—%" nom plywd fir—USG met fur chan 24" o.c. wire-tied to trusses—base att with 1" Type S screws 12" o.c.—1/16" veneer finish—joints taped— UL Des L528 clg wt 3	N/A	J
1½ hr.	Resil 2 layers ½" IMPERIAL FIRECODE "C" gypsum base & veneer finish ceiling—1" nom wd sub & fin flr—2x10 wd joist 16" o.c.—RC-1 chan 24" o.c. screw att over base layer—face layer screw att to chan 12" o.c.—1/16" veneer finish—joints taped— UL Des L510 clg wt 3	N/A	К
2 hr.	Resil 2 layers 5%" IMPERIAL FIRECODE "C" gypsum base & veneer finish ceiling—1" nom wd sub & fin flr—2x10 wd joist 16" o.c.—RC-1 chan screw att over base layer—face layer screw att to chan 12" o.c.—1/16" veneer finish—joints taped— UL Des L511 clg wt 3	N/A	L

description

In these systems, a veneer application (¹/16" to ³/32" thick) of specially formulated gypsum finish is applied in one coat over IMPERIAL Gypsum base attached to wood framing. DIAMOND Interior Finish, offering superior coverage and workability, provides economical surfaces with outstanding beauty and durability. Higher-strength IMPERIAL Finish provides abrasion and crack-resistant walls and ceilings of exceptional hardness. IMPERIAL Basecoat may be used as a superior base in a two-coat system for either finish or lime-gauging finishes used with conventional basecoats. IMPERIAL Base, 4 ft. wide, has a high-strength, high-density core, either regular, FIRECODE or FIRECODE "C" type, covered with special absorption face paper designed for veneer plastering. Veneer finish systems, as outlined below, are suitable for partitions and ceilings wherever standard plaster or drywall systems are used.

Partitions—Versatile IMPERIAL Gypsum Base is directly attached to wood studs with USG Type W Screws or nails. Where a 2-hour fire rating is required, double-layer FIRECODE "C" Base is used. To provide superior sound control, IMPERIAL Base is resiliently attached to one side of wood studs using the RC-1 Resilient Channel. Base is fastened to channels with power-driven USG Type S Screws. This system with THERMAFIBER Sound Attenuation Blankets inserted in the stud cavity, provides one of the most economical party walls.

Ceilings—High-quality, fire-resistant ceilings are rapidly installed with IMPERIAL Base applied directly to wood joists or over resilient channels for added sound control. With double-layer base separated by resilient channels, a 2-hour fire rating is provided.

IMPERIAL Gypsum Base and Finish are also used with steel studs and furring channels for noncombustible interior partitions, party walls, chase walls and furring (see System Folder SA-912 in this series for details).





function and utility

Veneer finish systems are ideal for load-bearing interior partitions and ceilings in residences, motels, garden apartments and other multifamily buildings requiring fire protection plus these extra features:

Durability—The high-strength (approx. 3,000 psi), abrasion- and crack-resistant features of IMPERIAL Finish offers the durability needed in high-traffic areas, and obtainable with few other materials.

Fire Resistance—2 hours with double-layer %" FIRECODE "C" Base; 1-hour rating using single-layer base in walls and ceilings (see table, page 1).

Sound Control—The systems offer sound isolation up to 53 STC with the use of resilient channels and insulating blankets; suitable for party walls (see table, page 1).

Fast Completion—Veneer finishes are easily applied, eliminate drying delays and are usually ready for next-day decorating or painting with breather-type paints. The white surface obtainable with DIAMOND Interior Finish, particularly when sand-floated or textured, may be acceptable without further decoration (see Decorating, page 3).

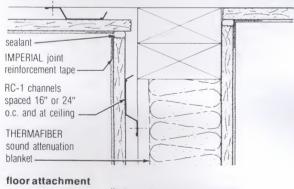
Economy—Simple, inexpensive components erect quickly at a lower cost than conventional plaster systems. Speedy finish application plus savings in decorating time make these systems competitive to drywall assemblies in many instances.

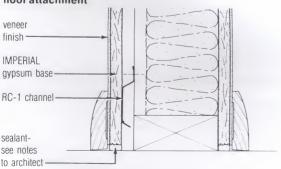
limitations

- 1. These constructions should not be used where normally exposed to excessive moisture, humidity or temperature.
- 2. Type S Screws must be used for attachment of single-layer base to RC-1 Resilient Channels.
- 3. RC-1 Resilient Channels must be attached to framing only with $1\frac{1}{4}$ " Type W Screws. Nails should not be used.
- **4.** Resilient ceilings should not be installed beneath highly flexible floor joists. Install only to framing meeting "Wood Framing Requirements" (see Specifications).

details

ceiling attachment





maximum frame spacing (1)

base and finish	wood framing spacing				
assembly	in	mm			
½" IMPERIAL Gypsum Base					
one layer, 1-coat system	16	406			
one layer, 2-coat system	16 or 24(2)	406 or 610(2)			
two layers, 1 & 2 coat system	24	610			
5/8" IMPERIAL Gypsum Base					
one layer, 1-coat system	16 or 24 (2)	406 or 610 (2)			
one layer, 2-coat system	24 (2)	610 (2)			
two layers, 1 & 2 coat system	24	610			

(1) For perpendicular or parallel application—Perpendicular preferred for maximum strength; parallel application not recommended for ceilings. For fire-rated construction, see test report. (2) 24" spacing requires joint treatment with DURABOND Compound and PERF-A-TAPE Reinforcing Tape.

maximum fastener spacing (1)

assembly	type of		max.	spacing
description	fastener	location	in	mm
single layer, wood frame & face layer of double	Ann. Ring Nails (2)	Ceilings Walls	7 8	178 203
layer assembly	11/4" Type W Screws	Clgs. & Walls	12	305
single layer, resilient channel	1" Type S Screws	Clgs. & Walls	12	305
base layer of double layer construction	Ann. Ring Nails (2) or 11/4" Type W Screws	Clgs. & Walls	24	610

(1) For non-fire rated assemblies; select fasteners for fire-rated construction from test report. (2) For annular ring nails, select length to provide 3/4" penetration into wood framing.

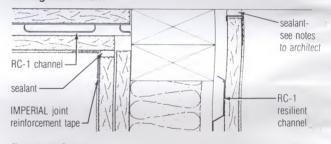
fixture attachment load data

fastener		allowable	withdrawal	allowa	ble shear			
	size		resistanc		resistance			
type	in	mm	ib	N (1)	ib	N (1)		
toggle or	1/8	3.18	20	89	40	178		
molly bolt	3/16	4.76	30	133	50	222		
	1/4	6.35	40	178	60	267		
no. 8 sheet								
into 25-ga. metal sheet		50	222	100	445			

(1) Newtons

ceiling attachment

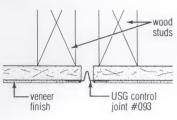




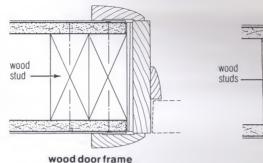
veneer finish IMPERIAL gypsum base THERMAFIBER sound attenuation blanket

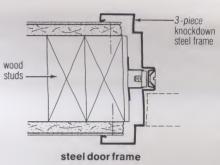
details

miscellaneous

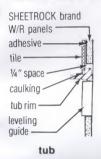




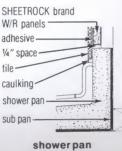




tub and shower details—single layer SHEETROCK Brand W/R Panels

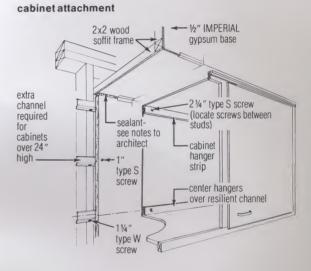












fixture attachments (light)







specifications—notes to architect

1. System Performance-U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.

2. Control Joints-Gypsum base surfaces should be isolated with control joints or other means where: (a) partition abuts a structural element (except floor) or dissimilar wall or ceiling; (b) construction changes within the plane of partition or ceiling; (c) partition run exceeds 30'; (d) ceiling dimensions exceed 50' in either direction with perimeter relief, 30' without relief.

Ceiling height door frames may be used as control joints. Lessthan-ceiling height frames should have control joints extending to ceiling from both corners. If control joints are not used, additional reinforcement is required at corners to distribute concentrated stresses.

- 3. Penetrations of the lath-and-plaster diaphragm, such as borrowed ints, access panels, light troffers, require additional reinforcement at corners to distribute concentrated stress if a control joint is not used.
- 4. Ceilings-To prevent objectionable sag in new gypsum base ceilings, the weight of overlaid unsupported insulation should not exceed 1.3 psf for 1/2" thick base with frame spacing 24" o.c.; 2.2 psf for 1/2" base on 16" o.c. framing and 5%" base on 24" o.c. framing. Foil-back base or a separate vapor retarder should be installed in all exterior ceilings, and the plenum or attic space vented with a min. 1/2-sq. in. net free area per sq. ft. of horizontal surface.
- 5. Sound tests are conducted under ideal laboratory conditions per

ASTM procedures. Comparable field performance depends on building design and careful attention to detailing and workmanship. Where these partitions are used for sound control, USG Acoustical Sealant is recommended to seal the partition perimeter and all cut-outs such as electrical boxes. Back-to-back penetrations of the diaphragm, flanking paths, door and borrowed-light openings should be avoided.

- 6. Wood Framing Requirements-Wood framing meeting minimum requirements of HUD/FHA, American Softwood Lumber Standard and local building codes is necessary for proper performance.
- 7. Ceramic Tile-IMPERIAL Gypsum Base is not recommended as a base for the adhesive application of ceramic and plastic tile and plastic-faced wall panels. SHEETROCK Brand W/R Gypsum Panels are recommended for this use (see details).
- 8. Decorating-All finishes applied over IMPERIAL Basecoat must be properly sealed before decorating. DIAMOND Interior Finish and IMPERIAL Finish may be painted the day after application with acrylic latex or vinvl breather-type paints. In some markets, DIAMOND Interior Finish is white and may be left undecorated; however, decorating should be specified and may be eliminated later if finished plaster is acceptable.
- 9. Zinc Alloy Accessories-Recommended where corrosion due to high humidity or saline content of aggregate is possible.
- 10. Additional Information-See U.S.G. technical folders in this series and in Sweet's General Building File: Construction Selector SA-100 for fire and sound-rated systems; Plasters, Bases & Accessories Folder SA-917 for general lathing and plastering specifictions; Texture and Paint Products Folder SA-933 for finishing product specifications; Building & Acoustical Insulation Folder SA-705 for insulation specifications.

Part 1: general

1.1 scope—Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

- **a.** In cold weather, all glazing shall be completed and the building heated to a minimum of 55°F. (13°C) before gypsum base installation. Air circulation shall be kept at a minimum level during veneer plastering until finish is dry.
- b. When low humidity, high temperatures and rapid drying conditions exist during gypsum base and plaster application, DURABOND Joint Compound and PERF-A-TAPE Reinforcement shall be used on all joints, internal corners, trim and corner beads and allowed to set and dry thoroughly before plaster application.

Part 2: products

2.1 materials

- a. IMPERIAL Gypsum Base—(½") (%") thick, 48" wide, (Regular) (Foil-Back) (FIRECODE) (FIRECODE "C").
- b. RC-1 Resilient Channel.
- c. 3" THERMAFIBER Sound Attenuation Blankets (size).
- d. Fasteners
 - -USG Screws (1", 11/8" Type S) (11/4" Type W).
 - —nails (1¼", 1¾", 1¾", 2" annular ring nails) (for fire-rated systems, specify from test report)—obtain locally.
- e. IMPERIAL Tape—(Type P) (Type S) for joint reinforcement.
- f. USG No. (800) (900) Corner Bead.
- J. USG Trim (701-A) (701-B) (801-A) (801-B) (P-1) (P-2).
- h. USG No. 093 Control Joint.
- I. USG Acoustical Sealant.
- . PERF-A-Tape Reinforcement and DURABOND Joint Compound.

Part 3: execution

3.1 gypsum base—direct attachment

Apply IMPERIAL Gypsum Base on ceilings first perpendicular to framing. Install base on sidewalls using (perpendicular) (parallel) application. Position all ends over framing in perpendicular application; all edges over framing members in parallel application. Use maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together.

Stagger end joints in successive courses with joints on opposite sides of partition placed on different studs. Float gypsum base at vertical interior angles by attaching the overlapping sheet of base only, at the angle; at horizontal interior angles by attaching both sheets of base no closer than 8" from the angle.

Drive fasteners in field of base first, working toward ends and edges. Hold base in firm contact with framing while driving fasteners. Space nails 7" o.c. on ceilings, 8" o.c. on walls, screws 12" o.c. and perimeter fasteners not less than 3" from ends or edges. Drive fastener heads flush with surface of base, not dimpled, and without breaking paper. Wherever base is not tight against framing, drive another fastener within 11/2" of first fastener.

Cut base to fit neatly around pipes, electrical outlets, medicine cabinets, etc. Remove any loose face paper at cut and fill gaps or holes with quick-setting plaster.

3.2 gypsum base—resilient attachment

Position RC-1 Resilient Channels at right angles to wood framing, space (16") (24") o.c. and attach with 11/4" Type W screws driven through holes in channel mounting flange. On walls, install channels with mounting flange down, except at floor. Locate channels 2" from floor and within 6" of ceiling. Extend channels into all corners and attach to corner framing. On ceilings, position first and last channels max. 6" from wall-ceiling angle. Cantilever channel ends no more than 6". Splice channels by nesting directly over framing member; screw-attach through both flanges. Reinforce with screws located at both ends of splice.

Where cabinets will be installed, attach RC-1 Channels to studs at center of top and bottom cabinet hanger brackets. When distance between hangers exceeds 24" o.c., install additional channel at midpoint between hangers.

Apply IMPERIAL Gypsum Base, ceiling first, with long dimension at right angles to channels, and end joints neatly fitted and centered over channel attachment flange. Attach with 1" USG Type S Screws spaced 12" o.c. across each channel and perimeter screws not less than %" from ends and edges. Support gypsum base around all cut-outs and openings.

For double-layer ceiling system, apply base layer with long edges across joists and end joints staggered. Fasten base to framing with 8d cement-coated nails spaced 7" o.c. Attach resilient channel through base layer perpendicular to framing with 1%" Type S Screws. Install face layer with long dimension across channels using 1" Type S Screws spaced 12" o.c.

3.3 accessory application

 a. Reinforcing Tape—Apply over full length of all gypsum base joints; do not overlap at intersection.

Type P Tape—Press firmly along entire length with steel trowel to insure firm wrinkle-free attachment.

Type S Tape—Apply with spring-driven stapler using 3%" staples. Use two staples at each end of tape and stagger intermediate staples 24" o.c. along length of tape. At wall-ceiling intersections and interior corners, staple 24" o.c. along ceiling edge or on one edge only.

- **b.** Corner Bead—Attach to all vertical and horizontal exterior corners with nails or 9/16'' galvanized staples spaced 12" o.c. along both flanges along entire length of bead.
- c. Casing Bead—Where partition or ceiling terminates against masonry or other dissimilar material, apply metal trim over gypsum base and fasten with nails or $\frac{9}{16}$ galvanized staples 12" o.c.
- **d. Vinyl Trim**—Slip USG P-1 Trim over gypsum base with long flange behind base. Install gypsum base with trim firmly abutting surface. For P-2 Vinyl Trim, provide 1/6" to 3/6" relief at ceiling perimeter. Remove protective paper from adhesive on web of trim and insert into relief, adhesive against wall surface. Press upward until long flange seats against ceiling.
- e. Control Joint—Install in direct-mounted face layer. Break base behind joint and back by double studs; attach joint to gypsum base with nails or %16" galvanized staples spaced 6" o.c. on both flanges along entire joint length

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, THERMAFIBER, SHEETROCK, IMPERIAL, PERF-A-TAPE, RC-1, DIAMOND, FIRECODE, DURABOND.

Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

fire-rated construction	acoustic		
description & test no.	STC	description & test no.	
Steel Stud—Resil Gypsum Lath & Plaster—2½" TRUSSTEEL studs 16" o.c.—TR-1 clips one side & TL-1 clips opp side—¾" ROCKLATH Base—½" 100:2 gypsum sand plaster—perimeter caulked wt 12 width 4¾"	46	TL-69-14	А
Steel Stud—Resil Gypsum Lath & Plaster—3 ¹ / ₄ " TRUSSTEEL Studs 16" o.c.—1" THERMAFIBER sound atten blkts—TR-1 clips one side & TL-1 clips opp side—¾" ROCKLATH Base— ½" 100:2-100:2 gypsum sand plaster—perimeter caulked wt 14 width 5½"	52	CK-664-38	В
Steel Stud—Gypsum Lath & Plaster—2½" TRUSSTEEL studs 16" o.c.—¾" ROCKLATH Base—1/2" 100:2-100:2 gypsum sand plaster wt 13 width 4½"	41†	TL-58-7	С
Steel Stud—Gypsum Lath & Plaster—2½" USG studs 16" o.c.—%" ROCKLATH Base—MS-1 clips both sides—½" 100:2½ gypsum sand plaster—perim caulked wt 14 width 4½"	45	CK-664-17	D
Steel Stud—Gypsum Lath & Plaster—2½" USG studs 16" o.c.—%" ROCKLATH Base—MS-1 clips both sides—1" THERMAFIBER sound atten blkts—½" 100:2½ gypsum sand plaster—perim caulked wt 15 width 4½"	49	CK-664-18	Е
	Steel Stud—Resil Gypsum Lath & Plaster—2½" TRUSSTEEL studs 16" o.c.—TR-1 clips one side & TL-1 clips opp side—¾" ROCKLATH Base—½" 100:2 gypsum sand plaster—perimeter caulked wt 12 width 4¾" Steel Stud—Resil Gypsum Lath & Plaster—3¼" TRUSSTEEL Studs 16" o.c.—1" THERMAFIBER sound atten blkts—TR-1 clips one side & TL-1 clips opp side—¾" ROCKLATH Base— ½" 100:2-100:2 gypsum sand plaster—perimeter caulked wt 14 width 5½" Steel Stud—Gypsum Lath & Plaster—2½" TRUSSTEEL studs 16" o.c.—¾" ROCKLATH Base— ½" 100:2-100:2 gypsum sand plaster wt 13 width 4½" Steel Stud—Gypsum Lath & Plaster—2½" USG studs 16" o.c.—¾" ROCKLATH Base—MS-1 clips both sides—½" 100:2½ gypsum sand plaster—perim caulked wt 14 width 4¼" Steel Stud—Gypsum Lath & Plaster—2½" USG studs 16" o.c.—¾" ROCKLATH Base—MS-1 clips both sides—1" THERMAFIBER sound atten blkts—½" 100:2½ gypsum sand plaster—perim	STC	STC description & test no.

description

In these systems, gypsum lath and plaster are attached to steel framing to form hollow, fire-resistant partitions with superior sound control features. With slight variations, they are also suitable for core walls and wall furring. Either of two types of studs are used:

TRUSSTEEL Studs—Made of high-tensile strength wire formed into an exceptionally strong non-load bearing stud. The open-web truss design provides a maximum of free space for encasing pipes, conduits or ducts, horizontally, vertically or diagonally, without impairing the structural integrity of the assembly. When attached to floor and ceiling with runner tracks and stud shoes, TRUSSTEEL Studs form superior strength framing for lath and plaster surfaces.

ROCKLATH Plaster Base, %" and ½" thick, serves as a rigid base for ½" sanded gypsum plaster. Lath is either directly attached to studs 16" o.c. with TRUS-LOK Clips TL-1 or resiliently attached with Resilient Clips TR-1. By using these specially designed resilient clips, the lath and plaster diaphragm is not rigidly coupled to the studs. The excellent sound-isolative efficiency of this system results from this resilient mounting of the plaster membrane and the column of air formed within the TRUSTEEL Studs (see table above).

USG Steel Studs—Roll-formed in several stud widths from corrosion-resistant steel, have punched holes to facilitate electrical installation. Studs are twisted in place between steel runners at the floor and ceiling. ROCKLATH Plaster Base is clip-attached with specially designed MS-1 clips or screw-attached with power-driven, self-drilling USG Type S Screws. Stud spacing is 16" o.c. for regular two-coat plaster application but may be increased to 24" o.c. which requires three-coat plaster application.

ROCKLATH Base has a gypsum core faced with special absorption paper to form a rigid base for the economical application of gypsum plasters. For these assemblies, ROCKLATH Base is available 3/8" and 1/2" thick and in two sizes (see Specifications, page 10).

function and utility

Sound Control—The systems offer sound attenuation suitable for party walls at a low cost (see table above).

Fire Resistance — Noncombustible components provide systems with 1-hour ratings (see table above).

Lightweight—These systems weigh appreciably less than masonry partitions of the same thickness.

Versatility—Systems are suitable for divider, corridor and party walls

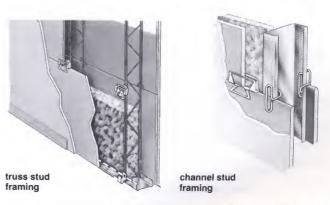
in every type of new construction — commercial, institutional and industrial — whenever smooth, hard, sanitary surfaces are required. Adapt easily to most modules and dimensions.

Strength—High structural integrity of gypsum lath and plaster provides easily maintained, durable surfaces highly resistant to abuse.

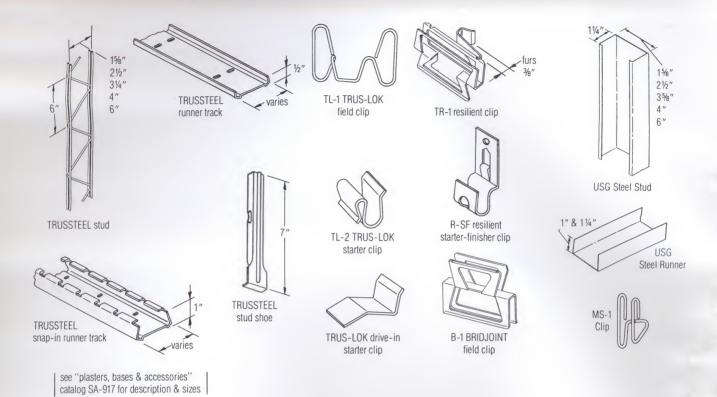
Economical—Plasters are readily pumped and spray-applied. The hollow construction simplifies fixture attachment and installation of conduit and piping. Systems provide an ample cavity for thermal and sound insulation.

limitations

- 1. Non-load bearing.
- 2. Max. frame spacing: 16" o.c. for TRUSSTEEL Studs and USG Steel Studs with 2-coat plaster application over base; 24" o.c. for Steel Studs with 3-coat plaster application.
- 3. Limiting heights, shown in tables, should not be exceeded.
- **4.** Door frames must be fabricated and anchored to prevent twisting and impact vibration (see details, pages 6 and 7).
- 5. Where mechanically suspended acoustical tile ceilings are used, finished partitions should extend from structural slab to structural slab, closing all openings, with perimeter relief as required.
- **6** ROCKLATH Base and standard plaster should be applied to only one side of TRUSSTEEL Studs with TR-1 Clips; use TL-1 Clips to attach ROCKLATH on other side.



components/technical data



TRUSSTEEL Stud

finished partition thickness—limiting heights

			finish	artition heights				
stud width		section modulus	direct resil. s attach. attach.					16" o.c. m)(2)(3)
in	mm	in ³	in	mm	in	mm	ft	m
15⁄8	41	.0635	3%	92	(1)	(1)	9	2.7
21/2	64	.1056	41/2	114	43/4	121	15	4.6
31/4	83	.1420	51/4	133	51/2	140	21	6.4
4	102	.1825	6	152	61/4	159	22	6.7
6	152	.277	8	203	81/4	210	26	7.9

(1) Not recommended for resilient attachment. (2) Resilient partition limiting height is 10° . (3) Limiting heights based on L/360 deflection.

USG Steel Stud

finished partition thickness—limiting heights

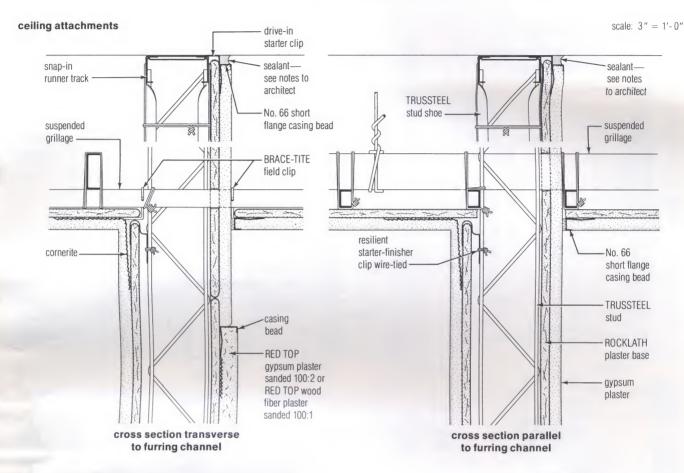
stud	stud	section	partition	(3) (4)			
designation (1)	width	modulus	thickness				
158ST	15/8"	.044 in ³	3%"	10'6"			
212ST	21/2"	.076 in ³ 41/4" 13'0		13'0"	11'6"		
358ST	35/8"	.125 in ³	53/8"	16'3"	14'3"		
400ST	4"	.143 in ³	5¾"	17'3"	15′0″		
600ST	6"	.255 in ³	73/4"	22'6"	19'9"		

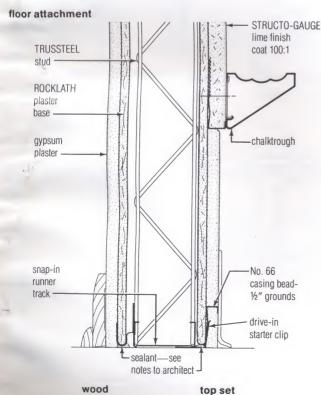
(1) Indicates size and product: 158—15%"; ST—stud. (2) Reduce ceiling height by 15% if lightweight aggregate basecoat is used. Limiting heights based on L/360 deflection. (3) For 16" stud spacing. (4) For 24" stud spacing.

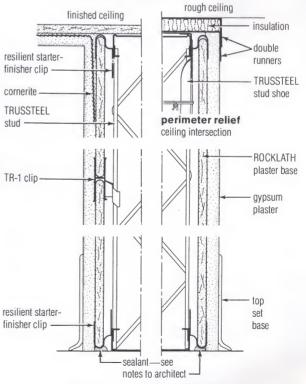
sound transmission loss—db

	method	band center frequency—Hz																					
test no.		125	160	175	200	250	315	350	400	500	630	700	800	1000	1250	1400	1600	2000	2500	2800	3150	4000	00 STC
TL-69-14	Lab	28	31	_	35	38	41	_	44	48	51	_	54	55	51	_	42	42	47		50	54	46
CK-664-38	Lab	36	44	_	47	48	49	_	50	50	50	_	51	52	51	_	50	52	53	_	55	56	52
CK-664-18	Lab	31	38	_	44	44	46	_	46	48	50	_	50	51	49	_	47	50	52	_	53	53	49
CK-664-17	Lab	28	34	_	43	43	44	_	46	47	49	_	50	51	44	_	41	49	52	_	54	54	45

details/resilient attachment

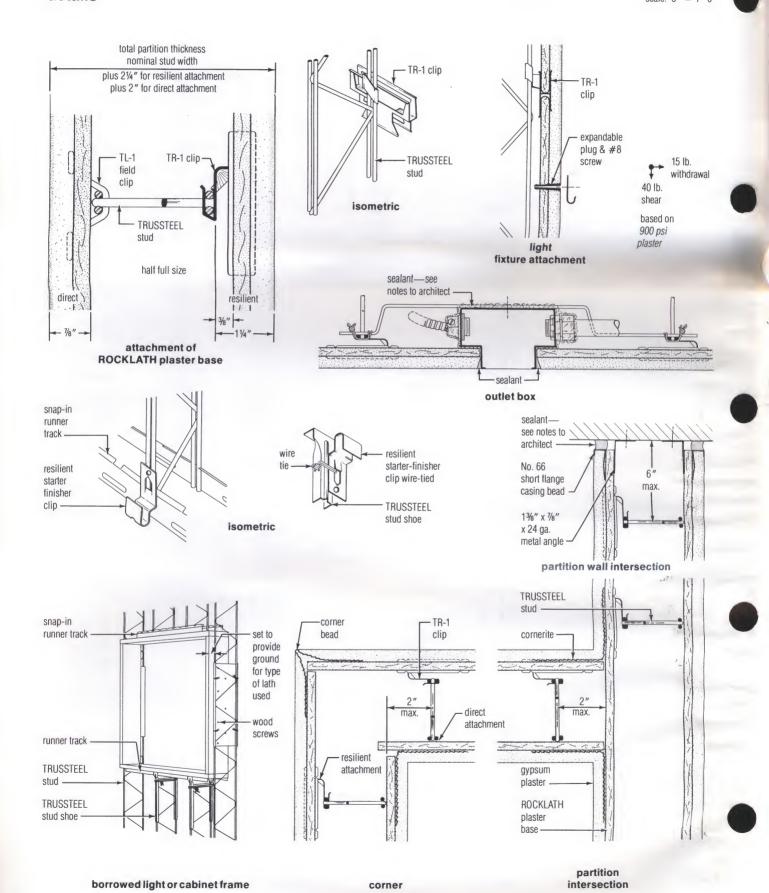




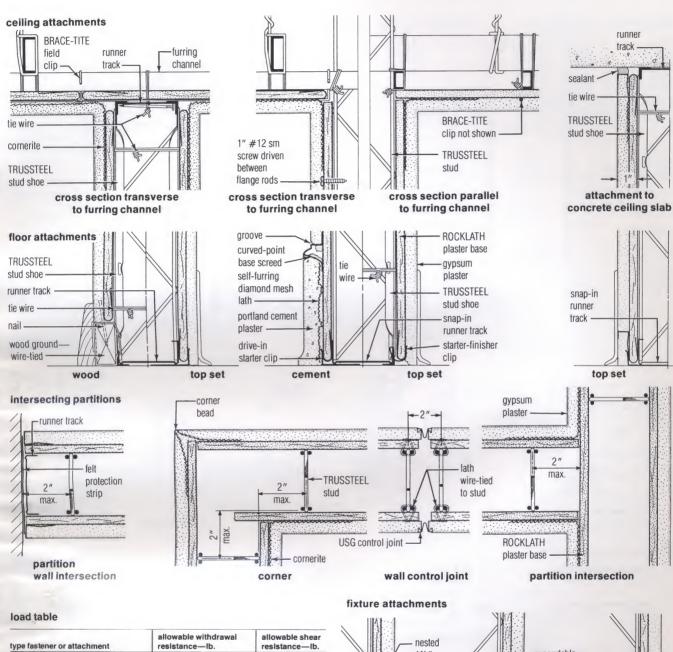


resilient TRUSSTEEL stud assemblies

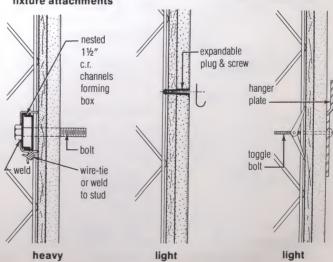
Steel-Framed Gypsum Lath & Plaster SA-915

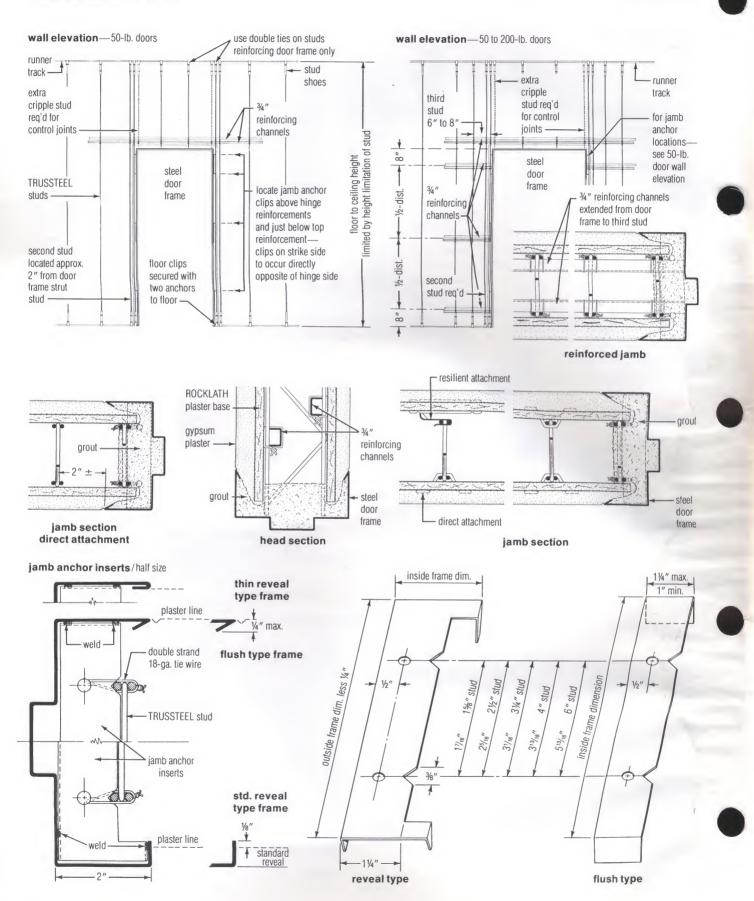


details/direct attachment

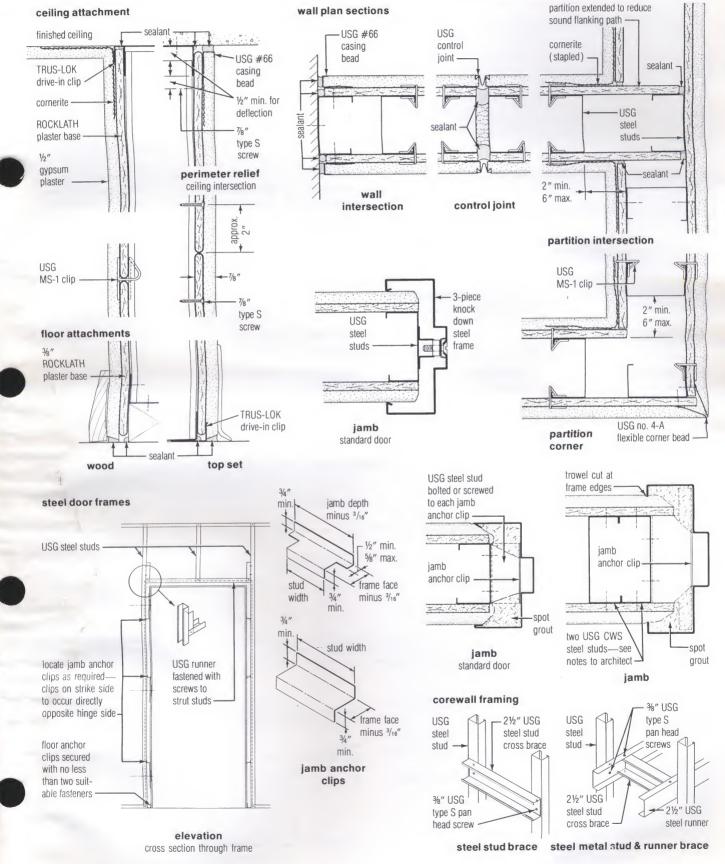


type fastener	or attachment	allowable withdrawal resistance—lb.	allowable shear resistance—lb.				
fiber or	#6 screw	10	40				
plastic	#8 screw	15	40				
plug	#10 screw	20	50				
	#12 screw	30	60				
	#14 screw	30	75				
toggle	1/8" bolt	75	50				
or	3/16" bolt	125	140				
molly	1/4" bolt	175	150				
type fastene	r or attachment	allowable impact load—lb					
plumbers bra attached with bolts and 11/2	5/16"	300	75				
type fastene	r or attachment	uniform load— lb. per bracket	uniform load— lb. per lln. ft.				
angle bracket	ts (24" o.c.)	100	50				
slotted standa	ards (24" o.c.)						
light (.063" th	ick)	40	20				
medium (.08:		100	50				
heavy (.094"							





details



exterior wall furring

description	comments						
TRUSSTEEL Studs 16" o.c. cross braced 4' o.c. on back chord, %" Foil-Back ROCKLATH base attached with TL-1 Clips, 1/2" sanded basecoat plaster, lime putty finish	Free-standing; allows for pipe chase clearance, good vapor retarder						
USG Steel Studs 16" o.c. set in runners, %" Foil-Back ROCKLATH base attached with 1" Type S Screws, ½" sanded basecoat plaster, lime putty finish	Free standing; allows for pipe chase clearance; good vapor retarder						
USG Z-Furring Channels applied vertically 16" or 24" o.c., THERMAFIBER Z-Furring Insulation between channels, %" Foil-Back ROCKLATH base attached with 1" Type S Screws, ½" sanded basecoat plaster, lime putty finish.	Noncombustible system with mineral fiber insulation; suitable $\it C$ for up to 3" thick insulation; no limiting height						
USG Z-Furring Channels applied vertically 16" or 24" o.c., FOAMULAR Extruded Polystyrene Insulation between channels, %" Foil-Back ROCKLATH Base attached with 1" Type S Screws, 1/8" sanded basecoat plaster, lime putty finish	Suitable for up to 2" thick insulation; no limiting height.						

It is recommended that all exterior walls be furred. Asphaltic and bituminous bonding agents are not recommended as a plaster base. 3/8" Foil-Back Rocklath Plaster Base, 16" x 96", and plaster may be used with three different framing methods to provide a vapor retarder, thermal insulation, and chase space for pipes, conduits and ducts. USG Z-Furring Channels, spaced 16" or 24" o.c., are used to mechanically attach Thermafiber Z-Furring Blankets or Foamular Insulation to the interior of exterior walls. The insulation panels are applied progressively as the Z-Furring Channels are attached to the wall. Gypsum lath is attached to the channel flanges to provide a surface isolated to a great degree from the masonry wall. In new construction and in remodeling, this system provides a highly insulative self-furring solid backup for Rocklath Plaster Base and 1/2" gypsum plaster.

USG Z-Furring Channels, suitable for 1" to 3" thick insulation, are formed from hot-dipped galvanized steel for added corrosion resistance. Fire-resistant Thermafiber Z-Furring Blankets provide a non-combustible assembly and offer low heat transmission. Blankets are

semi-rigid spun mineral fiber mats meeting requirements for Class A construction. For other applications, FOAMULAR Extruded Polystyrene Insulation offers a range of thicknesses and insulating values. Thermal resistance (R) values for various assemblies are shown below.

USG Steel Studs are erected vertically between floor and ceiling runners. Foil-Back Rocklath Base is attached to studs with 1" Type S Screws and gypsum plaster applied to ½" grounds. The assembly allows ample chase width for plumbing and electrical services. See table below for limiting heights.

TRUSSTEEL Studs spaced 16" o.c., are inserted top and bottom into TRUSSTEEL Snap-in Runner Track. Horizontal ¾" channel stiffeners are wire-tied to studs at third-points of partition height or 48" o.c. max. ¾" Foil-Back ROCKLATH Base is clipped to the studs and plastered to ½" grounds. For braced furring, an extra ¾" channel at the mid-point between floor and ceiling is wire-tied to the studs and attached to the wall with USG Adjustable Wall Furring Brackets spaced not more than 32" o.c. horizontally. See table below for limiting heights.

design thermal resistance (R) values (1)

wall construction	nom. wall thickn.	unfin. wall	furred wall (2) (no. insul.)	wall insulated with—							
				THERMAFIBER Z-Furring Blankets				FOAMULAR extruded polystyrene			
				1" (4.17)	1½" (6.00)	2" (8.00)	3" (12.00)	1" (5.41)	1½" (8.12)	2" (10.82)	3″ (16.23)
4" face brick 8" block	12"	3.01	4.34	7.59	9.42	11.42	15.42	8.83	11.54	14.24	19.65
4" face brick 4" com. brick	8"	2.09	3.42	6.67	8.50	10.50	14.50	7.91	10.62	13.32	18.73
poured conc. 140 lb./cu. ft.	8"	1.49	2.82	6.07	7.90	9.90	13.90	7.31	10.02	12.72	18.13
cinder block	8"	2.57	3.90	7.15	8.98	10.98	14.98	8.39	11.10	13.80	19.21

(1) Resistances based on procedures and design values from 1981 ASHRAE Handbook of Fundamentals, winter conditions (15 mph wind) and neglect the effect of furring channels and fasteners. (2) Interior wall finish: %" ROCKLATH Base (R-0.32) and ½" gypsum-sand plaster (R-0.09). R-values for insulation, shown in parentheses, based on 40°F. mean temperature for FOAMULAR Insulation and 75°F. mean temperature for other insulation and components. R-value for 1" thick FOAMULAR Insulation is 5.0 at 75°F. mean temperature.

limiting heights—USG Stud Furring

	maximum height (1)					
stud designation	studs 16" o.c.	studs 24" o.c. (2)				
158ST	8'3"	7'3"				
212ST	10'9"	9'6"				
358ST	13'9"	12'0"				
400ST	14'9"	13'0"				
600ST	19'9"	17′3″				

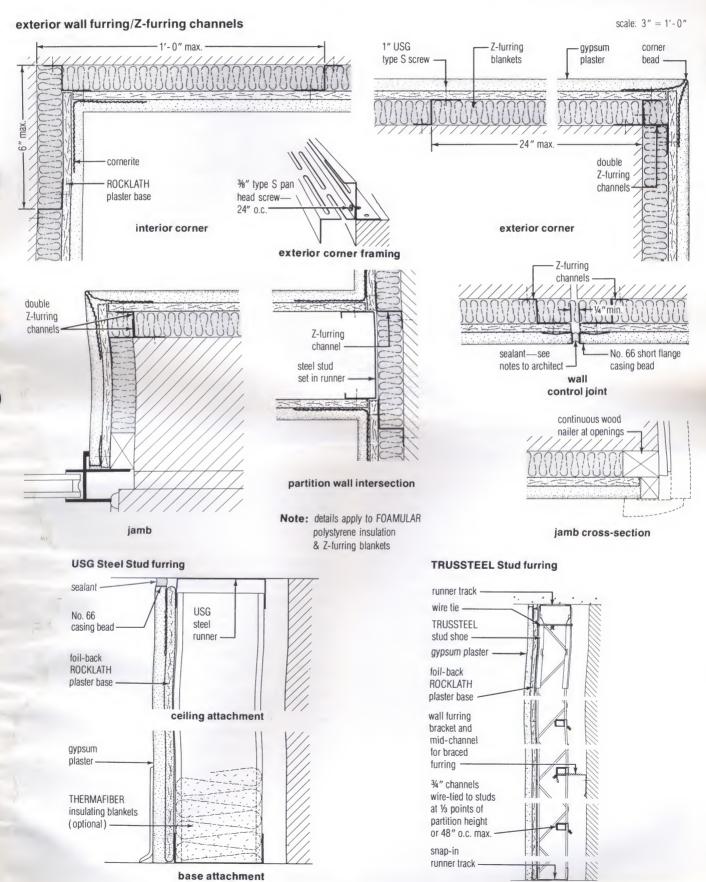
(1) For free-standing furring; based on L/360 deflection. (2) Apply plaster by 3-coamethod

limiting heights—TRUSSTEEL Stud Furring

	maximum helght (1)					
stud size	braced furring	free-standing furring				
15/8"	9′	6′				
21/2"	15′	10'				
31/4"	21'	14'				
4"	22'	15'				
6"	26′	17'				

(1) Based on 16" spacing between studs and L/360 deflection.

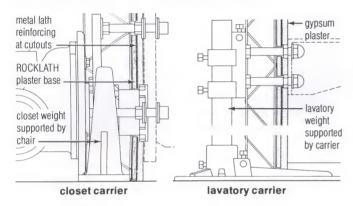
Steel-Framed Gypsum Lath & Plaster SA-915

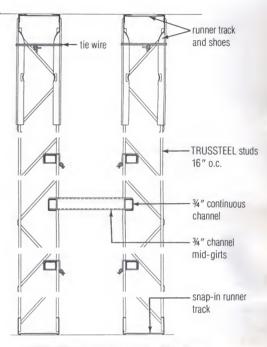


core walls/specifications

Core walls, as vertical shafts encasing the usual plumbing supply and waste lines, vent ducts and electrical conduits, require more free space than can be provided within the usual partition assembly.

Core walls are easily constructed using either TRUSSTEEL Studs or USG Steel Studs, ROCKLATH Plaster Base and ½" plaster, provided proper bracing is used to compensate for the stress skin action of the one side. For TRUSSTEEL Studs the unfinished side of the studs should be braced with ¾" continuous channel girts at quarter-points vertically or 48" o.c. max., and ¾" channel bracket mid-girts spaced 36" o.c. horizontally. For USG Steel Studs, 2½" steel stud cross braces are screw-attached to core-wall studs. When core-wall studs are not directly opposite, steel stud cross braces 24" o.c. are securely anchored to a continuous horizontal 2½" runner screw-attached to core-wall studs within the cavity (see page 7 for details).





TRUSSTEEL stud core wall framing

specifications

notes to architect

- 1. System Performance—U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.
- **2.** Plaster Base–16" x 96" ROCKLATH Plaster Base is preferred on standard plaster TRUSSTEEL Stud installations, and particularly over door frames or other openings.
- 3. Partition Framing-Fire-rated partitions using standard plaster require that TRUSSTEEL Studs be attached to TRUSSTEEL or Snap-In Runner Track with TRUSSTEEL Stud Shoes at the ceiling. TRUSSTEEL Snap-In Runner Track with studs cut accurately to lengths may be used for floor and ceiling attachment where the construction is not fire-rated. This track may be used at the floor on fire-rated partitions.
- 4. Steel door and borrowed-light frames should be at least 16-ga. steel, shop primed, with throats accurately formed to overall thickness of partition. They should be anchored at floor with 16-ga. steel plates welded to trim flanges, with provision for two power-driven anchors or equal per plate. Four jamb anchor inserts should be provided in each jarnb, welded to the trim returns.

Grouting and additional reinforcement at the jamb are recommended for all door frames and are required for heavy (over 50 lb. with hardware) or oversize doors which also require use of door closers and bumpers. Grout should be raked out to allow insertion of lath and plaster in frame; lath and plaster must not terminate against trim.

5. Control Joints-Lath and plaster surfaces should be isolated with control joints or other means where: (a) partition abuts a structural

element (except floor) or dissimilar wall or ceiling; (b) construction changes within the plane of the partition; (c) partition run exceeds 30'.

Ceiling height door frames may be used as control joints. Less-thanceiling height frames should have control joints extending to the ceiling from both corners. If control joints are not used, additional reinforcement is required at corners to distribute concentrated stresses.

- **6.** Penetrations of the lath-and-plaster diaphragm such as borrowed lights, access panels, light troffers, require additional reinforcement at corners to distribute concentrated stress if a control joint is not used.
- 7. Plaster-metal Interface—Where a plaster surface is flush with metal, metal bucks, metal windows, or metal base, the plaster should be grooved between the two materials.
- 8. Fixture Attachment–Lightweight fixtures and trim should be installed using plastic plugs or other expandable anchors for screw attachment. Heavy fixture attachment is not recommended on resilient lath and plaster surfaces.

Wood inserts for fixture attachment on non-resilient surfaces must always be wire-tied to inside of TRUSSTEEL Stud chords to prevent breaking up stress skin of lath and plaster.

For USG Steel Studs, wood or metal mounting strips for cabinets and shelving should be toggle bolted through lath and plaster, locating fasteners as near studs as possible.

- 9. Ceramic Tile-ROCKLATH Plaster Base is not recommended as a base for adhesive application of ceramic and plastic tile. SHEETROCK Brand W/R Gypsum Panels are recommended for this use over USG Steel Studs. Where ceramic tile is required with TRUSSTEEL Studs, change the plaster base from gypsum to metal lath (see U.S.G. folder CS-6) and apply portland cement-lime plaster as a base for tile.
- 10. Sound tests are conducted under ideal laboratory conditions per

Steel-Framed Gypsum Lath & Plaster SA-915

ASTM procedures. Comparable field performance depends on building design and careful attention to detailing and workmanship. Where these partitions are used for sound control, USG Acoustical Sealant is recommended to seal the partition and all cut-outs such as electrical boxes. Back-to-back penetrations of the diaphragm, flanking paths, door and borrowed-light openings should be avoided. Use sand aggregate only.

- **11. Zinc alloy accessories**—Recommended where corrosion due to high humidity or saline content of aggregate is possible.
- 12. WARNING: COMBUSTIBLE. FOAMULAR Polystyrene Insulation and other rigid foam insulation will ignite if exposed to fire of sufficient heat and intensity. Use only as directed by the specific instructions accompanying the product.
- 13. High-rise buildings—Variable wind pressure can cause a structure to drift or sway. This can result in movement of the non-load bearing partitions, thus causing noise. United States Gypsum Company assumes no responsibility for the prevention, cause, or repair of these job-related noises.
- 14. Additional Information—See U.S.G. technical folders in this series and in Sweet's General Building File: Construction Selector SA-100 for fire and sound-rated systems; Plasters, Bases & Accessories SA-917 for general lathing and plaster specifications; Texture and Paint Products SA-933 for finishing product specifications; FOAMULAR Insulation SA-710 for data on rigid polystyrene insulation.

Part 1: general

1.1 scope-Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

In cold weather, all glazing shall be completed and the building heated to a minimum of 55°F. (13°C) before plaster base installation. Ventilation should be provided to carry off excess moisture.

Part 2: products

2.1 materials

- TRUSSTEEL Runner Track—widths 15%", 21/2", 31/4", 4", or 6" (see Note 3, page 10).
- b. TRUSSTEEL Snap-In Runner Track—widths 15%", 21/2", 31/4", or 4" (see Note 4, page 10).
- C. TRUSSTEEL Studs—widths 15%", 2½", 3¼", 4", or 6 (see Note 4, page 10).
- d. TRUSSTEEL Stud Shoes.
- e. R-SF Resilient Starter-Finisher Clip.
- f. TRUS-LOK Drive-in Starter Clip.
- g. TR-1 Resilient Field Clip.
- h. TL-1 TRUS-LOK Field Clip.
- I. BRIDJOINT B-1 Field Clip.
- USG Corner Bead No. (1-A) (4-A).
- USG Self-Furring Junior Diamond Mesh Metal Lath.
- USG Cornerite (2" x 2") (3" x 3").
- m. USG Striplath.
- n. USG No. 66 Casing Bead.
- o. USG Adjustable Wall Furring Bracket.

- p. USG Cold-Rolled Channels 3/4", 11/2".
- . 18-ga. tie wire.
- ROCKLATH Plaster Base—(3½" or 1½" x 16" x 48") (3½" x 16" x 96") (regular) (foil-back) (FIRECODE).
- . Insulation
 - —THERMAFIBER Sound Attenuation Blankets (1") (1 1 /2") (2") (3") x 24" x 48".
 - —THERMAFIBER Z-Furring Blankets (1") (11/2") (2") (3") x 24" x 48".
 - —Foamular Extruded Polystyrene Insulation (1") ($1^{1/2}$ ") ($2^{\prime\prime}$) ($2^{\prime\prime}$) × ($16^{\prime\prime}$) ($24^{\prime\prime}$) × $96^{\prime\prime}$.
- t. USG Steel Studs—158ST (15%"), 212ST (2½"), 358ST (35%"), 400ST (4"), 600ST (6"), lengths as required.
- u. USG Steel Runners—158CR (15%"), 212CR (2½"), 358CR (35%"), 400CR (4"), 600CR (6"), for USG Steel Studs.
- v. USG Z-Furring Channel (1") (11/2") (2") (3").
- w. Fasteners—USG %" Type S, ½" Type S-12 Pan Head Screws; 1" Type S Bugle Head Screws.
- x. USG MS-1 Clip.
- y. USG Control Joint #50, #75, #15 Expansion Joint.
- z. Caulking-USG Acoustical Sealant.

Part 3: execution

3.1 truss stud system

3.1.1 partition framing erection

Install TRUSSTEEL Studs of the size shown on the plans or as herein specified, spaced max. 16" o.c. Accurately align all partitions according to the partition layouts.

Securely attach runner tracks:

- 1. To concrete slabs—Using concrete stub nails or power-driven anchors, spaced max. 24" o.c.
- 2. To ceiling grillage—Wire-tie, using double-strand 18-ga. tie wire. spaced max. 24" o.c.
- To plaster or gypsum base—Toggle bolt or wire-tie, spaced max. 24" o.c.

Place studs, cut to nominal ceiling height, vertically into and resting upon floor runner track. Top of studs can be no more than %" from ceiling with Snap-In Track; no more than 3" from ceiling with TRUSSTEEL Runner Track.

Secure studs to Snap-In Track by twisting until studs engage notches in both floor and ceiling tracks; to TRUSSTEEL Runner Track with TRUSSTEEL Stud Shoes, crimped or wire-tied with double-strand 18-ga. wire.

Secure studs immediately adjacent to door and borrowed light frames with two wire ties of double-strand 18-ga. wire.

3.1.2 door frames

Insert TRUSSTEEL Studs into steel door frame engaging notches of jamb anchor clips, and securely wire tie each chord of stud to each jamb anchor. Install second stud each side of door frame, approximately 2" from strut stud.

Install two 34" cold-rolled channels over head of door, extending out to engage third stud on each side. For heavy oversize doors, install additional horizontal reinforcing channels in pairs each side of door jamb and position 8" from head and floor and at mid-height. Securely tie these aligning channels to inside of stud chord at each intersection.

3.1.3 direct plaster base attachment

Apply ROCKLATH Plaster Base starting at bottom with long dimension at right angles to studs. Butt lath together and clip in place using (TRUS-LOK Starter Clip TL-2) (Drive-in Clips) and TRUS-LOK Field Clips TL-1, spaced not to exceed 16" o.c. Fasten finishing course of ROCKLATH with 1" #12 flat head self-tapping sheet metal screws driven between vertical stud wires and spaced 8" from ceiling. Stagger end joints of lath between studs and align using BRIDJOINT B-1 Field

Clips at all lath corners. Cut lath accurately and fit neatly around all electrical outlets, openings, etc.

3.1.4 resilient plaster base attachment

Apply Rocklath Plaster Base starting at bottom with long dimension at right angles to studs. Butt lath together and resiliently clip in place using Resilient Starter-Finisher Clip R-SF and Resilient Field Clip TR-1, spaced max. 16" o.c. Stagger end joints of lath between studs and align using BRIDJOINT B-1 Field Clips at all lath corners. Cut lath accurately and fit neatly around all electrical outlets, openings, etc.

3.1.5 wall furring erection

On partitions designated as vertical furring, bridge back chord of TRUSSTEEL Stud using continuous 3/4" channels at third points or not to exceed 48" o.c. and at mid-height. Saddle-tie channels to each stud.

On braced furring, securely attach mid-point bridging channel to masonry back-up with USG Adjustable Wall Furring Brackets 32" o.c.

Install USG Adjustable Wall Furring Brackets with crimped edges up, using (one 2" cut nail in mortar joints of brick, clay tile, or concrete block or in field of lightweight aggregate blocks) (5%" concrete stub nails or power-driven nails or other suitable fasteners in monolithic concrete) driven through top hole of bracket. Apply brackets to masonry walls at mid-height of furred wall and spaced not over 4" from columns or other abutting construction and not over 32" o.c. horizontally and 48" o.c. vertically, and as required above and below windows. Lay mid-height furring channel horizontally on furring brackets with legs down, and wire-tie to bracket with double-strand 18-ga. tie wire. Bend excess bracket length down.

3.2 steel stud system

3.2.1 partition framing erection

Attach USG Steel Runners at floor and ceiling to structural elements with suitable fasteners located 2" from each end and spaced 24" o.c., or to suspended ceilings with toggle or molly bolts spaced 16" o.c.

Position USG Steel Studs vertically, engaging both floor and ceiling runners, and spaced max. (16") (24") o.c. When necessary, splice studs with 8" nested lap and one positive attachment per stud flange. Place studs in direct contact with all door frame jambs, abutting partitions, partition corners and existing construction elements. Where studs are installed directly to exterior walls and possibility of water penetration through walls exists, install asphalt felt strips between studs and wall surfaces.

Anchor all studs adjacent to door and window frames, partition intersections, and corners to ceiling and floor runner flanges with USG Metal Lock Fastener tool or screws. Securely anchor studs to jamb and head anchor clips of door or borrowed-light frames by bolt or screw attachment (not required for frames with structural bar struts). Over steel door and borrowed-light frames, place a cut-to-length section of runner track, with a web-flange bend at each end, horizontally and secure to strut-studs with two screws in each bent web. Position a cut-to-length stud (extending to the ceiling runner) at the location of vertical joints over door frame header.

3.2.2 plaster base installation

Apply Rocklath Plaster Base, bottom course first, with face out, long dimension at right angles to studs and all joints butted together. Cut lath to fit neatly round all electrical outlets, openings, etc. Place end joints between studs, staggered in successive courses. Align and support ends of lath with BRIDJOINT B-1 Clips at top, center and bottom of each butt joint. Secure lath tightly in place at floor and ceiling with TRUS-LOK Drive-in Starter Clip spaced 16" o.c.

For clip attachment, use one MS-1 Clip at every intersection of lath edges and studs.

For screw attachment, use two 1" type S screws per stud, each located 2" from lath edge.

3.2.3 chase wall erection

Align two parallel rows of floor and ceiling runners spaced apart as detailed. Attach to concrete slabs with concrete stub nails or powerdriven anchors 24" o.c., to suspended ceilings with toggle or molly bolts 16" o.c., or to wood framing with suitable fasteners 24" o.c.

Position steel studs vertically in runners, (16") (24") o.c., with flanges in the same direction, and with studs on opposite sides of chase directly across from each other. Anchor all studs adjacent to door and window frames, partition intersections and corners to floor and ceiling runner flanges with USG Metal Lock Fastener or screws.

Install 21/2" steel stud bracing between rows of studs. Anchor web at each end of steel brace with two 3/8" pan head screws. When chase wall studs are not opposite, install steel stud cross braces 24" o.c. horizontally and securely anchor each end to a continuous horizontal 21/2" runner screw-attached to chase wall studs within the cavity.

3.2.4 Z-furring channel attachment

Erect insulation vertically and hold in place with Z-furring channels spaced (16") (24") o.c. Except at exterior corners, attach narrow flanges of furring channels to wall with concrete stub nails or power-driven fasteners spaced 24" o.c. At exterior corners, attach wide flange of furring channel to wall with short flange extending beyond corner. On adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with a standard width insulation panel and continue in the regular manner. At interior corners, space second channel not more than 12" from corner and cut insulation to fit. Hold mineral-fiber insulation in place until plaster base is installed with 10"long staple field-fabricated from 18-ga. tie wire and inserted through slot in channel. Apply wood blocking around window and door openings and as required for attachment and support of fixtures and furnishings.

3.3 accessory application

- a. Cornerite-Install in all interior plaster angles. Staple at the edges.
- b. Metal Corner Bead-Provide on all external plaster corners in single lengths whenever possible. Fasten securely with galvanized staples, spaced max. 8" o.c.; stagger in two wings.
- c. Casing Bead-Install where indicated to provide full plaster grounds. Cut and miter ends accurately. Staple in place.
- d. Reinforcing-Install a strip of self-furring diamond mesh lath over joints between dissimilar plaster bases. At all openings, reinforce corners by attaching a 6" x 12" piece of self-furring diamond mesh lath across corners. Staple in place.
- e. Control Joint-Provide as detailed and where indicated. Staple in

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, TRUSSTEEL, ROCKLATH, BRIDJOINT, TRUS-LOK, THERMAFIBER, SHEETROCK, STRUCTO-GAUGE, RED TOP, BRACE-TITE, FIRECODE. FOAMULAR is a

Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

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General Offices: 101 South Wacker Drive, Chicago, Illinois 60606

description and utility

UNITED STATES GYPSUM produces the industry's broadest and bestknown line of plasters, bases, metal structural members and lathing accessories. From these have been engineered dozens of partition. ceiling and wall furring assemblies, each of which provides different characteristics of structural stability, fire resistance and sound transmission loss. Performance and specification of these assemblies are covered in individual U.S.G. System Folders, which are keyed in turn to the U.S.G. Construction Selector index.

Basic information on the plastering components available for such assemblies is included here. Proper use of U.S.G. plaster bases and plasters provides the secure bond necessary to develop strength and resistance to abuse and cracking. A "mechanical" bond is formed when plaster is pressed through the mesh of metal lath, forming keys on the back side. A "suction" bond is formed when gypsum plaster is applied over gypsum lath and masonry bases; tiny needle-like plaster crystals penetrate the surface pores of the base by suction.

Bases and accessories are covered in this catalog in five groups: (1) Gypsum Plaster Bases; (2) Metal Lath; (3) Corner Beads, Trim, Control Joints; (4) Lath Attachment Clips and Screws; (5) Structural Accessories.

Plastering products are covered in four classifications, starting on page 7: (6) Veneer Finishes; (7) Basecoat Plasters; (8) Finish and Gauging Plasters and Finishing Limes; (9) Special Plasters.

Descriptions, uses, properties and limitations are shown for each product. General lathing and plastering specifications appear on

For the beauty and durability of which plaster is capable, rigid requirements should be followed as to number of coats applied. Three-coat work is mandatory on all metal lath, and on edgesupported gypsum lath used in ceilings; three-coat work is desirable on all gypsum lath; two-coat work is acceptable on gypsum lath when properly supported, and masonry plaster bases. Exceptions are noted below for IMPERIAL Veneer Plasters.

In the preparation of plastering specifications, consideration should be given to the selection of materials not only for compatability, but for the quality of the structure to be plastered. Since ANSI and AIA specifications are based on minimum standards, they should be followed only in applications where minimum quality is desired. It is wise to upgrade plastering specifications wherever possible.

Plastering Performance Selector-Following are general recommendations listed in the order of preference—No. 1 in each case being expected to produce the highest quality results:

Basecoat Plaster (over metal lath)

Scratch Coat

- 1. STRUCTO-BASE(1) Plaster, sanded 100:2
- 2. Wood Fiber, neat, or sanded up to 100:1
- 3. Wood Fiber, neat, or sanded up to 100:1
- 4. RED TOP Gypsum Plaster, sanded 100:2
- 5. Wood Fiber, neat, or sanded up to 100:1
- 6. Wood Fiber, neat, or sanded 100:1

Brown Coat

STRUCTO-BASE Plaster, sanded 100:3 Wood Fiber Plaster. sanded up to 100:1

RED TOP Gypsum Plaster, sanded 100:2

RED TOP Gypsum Plaster, sanded 100:3

STRUCTO-LITE Plaster (sand float finish only)

RED TOP Gypsum Plaster, perlited 100:2 (sand float finish only)

(1) Verify availability with your local U.S.G. sales representative.









Basecoat Plaster (over gypsum lath)

See "Use of Aggregates" table, page 8.

Aggregates

- 1. Sand
- 2. Mill-mixed Perlite
- 3. Job-mixed Perlite
- 4. Job-mixed Vermiculite

Note: Lightweight aggregates should not be used on a construction where sound isolation is a

Veneer Finishes (over veneer base)

- 1. IMPERIAL Basecoat and Finish (two-coat system)
- 2. IMPERIAL Basecoat and other appropriate finish (two-coat system)
- 3. IMPERIAL Finish (one-coat system)
- 4. DIAMOND Interior Finish (one-coat system)

Finish Coats

Float Finishes

- 1. IVORY or SNOWDRIFT Lime (92% hydrate), Keenes Cement and white silica sand
- 2. GRAND PRIZE or RED TOP Lime, RED TOP Gauging and white silica

Smooth Trowel Finishes

- 1. IVORY OF SNOWDRIFT Lime and STRUCTO-GAUGE Plaster
- 2. RED TOP Finish
- 3. IVORY or SNOWDRIFT Lime, RED TOP Gauging, with 1/2 cu. ft. of perlite fines or fine silica sand
- 4. IVORY or SNOWDRIFT Lime and Keenes Cement
- 5. GRAND PRIZE or RED TOP Lime, and RED TOP Gauging Plaster

NOTE: Float Finish 1 and Trowel Finish 3 (except over metal lath) are the only finishes recommended for use over a basecoat containing lightweight aggregate. Smooth Trowel Finishes 1, 2 and 4 provide high abrasion resistance and because of their hardness must be used over a comparably hard basecoat (see limitations, page 9).

types and functions

1. Gypsum Plaster Bases

description

ROCKLATH, IMPERIAL and USG R.H. plaster bases are gypsum lath in sheet form providing a rigid base for the economical application of gypsum plasters. A special gypsum core is faced with multi-layered laminated paper designed to check plaster slide, control absorption and resist lath sag.

These gypsum bases are fabricated in thicknesses of \(\%'', \(\gamma_2'' \) and \(\%'', \) and in seven different products for specific uses as listed below. All ROCKLATH Bases comply with ASTM C37 and Federal Specification SS-L-30D, Type I. IMPERIAL Bases comply with ASTM C588 and Federal Specification SS-L-30D, Type VI.

Thermal coefficient of expansion (unrestrained): 9.0×10^{-6} in. per in. per deg. F. (40° - 100° F); hygrometric coefficient of expansion (unrestrained): 7.2×10^{-6} in. per in. per % r.h. (5%-90% r.h.)

limitations

- 1. Maximum frame and fastener spacing is dependent on thickness and type of lath used. Refer to appropriate system folder for details.
- 2. Should be used with gypsum plaster only; except IMPERIAL Gypsum Base may be used for one-coat application of DIAMOND Interior Finish. Bond between lime putty finishes or portland cement plaster and ROCKLATH Base is inadequate.
- 3. IMPERIAL Base with 1-coat IMPERIAL Finish has a vapor permeance of 5.3 perms. For higher resistance to vapor transmission, Foil-Back ROCKLATH Plaster Base and IMPERIAL Gypsum Base should be used.
- Should not be used in areas exposed to excessive moisture for extended periods. USG galvanized metal lath and portland cementlime plaster are recommended.

IMPERIAL Gypsum Base is a special gypsum lath in large sheet form, designed for use with veneer finishes. Available in Regular, FIRECODE and FIRECODE "C" core and Foil-Back 48" wide, ½" or 5%" thick, 8 to 14-ft. lengths. FIRECODE and FIRECODE "C" types have fire-rated cores which add fire protection and are listed by UL under Label Service. In tests per ASTM C355 (desiccant method), ½" foil-back panels showed a vapor permeance of 0.06 perm. The ½" to ½" plaster thickness is applied after joints have been treated with IMPERIAL glass fiber open-weave tape. USG No. 800 or 900 corner bead is used.

ROCKLATH FIRECODE Plaster Base is a gypsum lath which combines all the advantages of Regular ROCKLATH Base with additional resistance to fire exposure—the result of a specially formulated core containing special mineral materials. Size: nom. 16" x 48", %" thick.

Foil-Back ROCKLATH Plaster Base is made in the same sizes as Regular ROCKLATH Base, but has special kraft-backed bright aluminum foil laminated to the back side. When applied with the foil surface next to the framing, the foil-back base helps prevent interior moisture from entering wall and ceiling spaces. It creates an effective vapor retarder at no additional labor cost. In tests per ASTM C355 (desiccant method), ROCKLATH Base showed a vapor permeance of 0.06 perm, a value well below the 1.0 perm limit permissible under HUD requirements. In addition, foil-back base has an emittance value of 0.05. This value is used in conjunction with the ASHRAE Handbook of Fundamentals for determining the thermal insulation value of a system when the foil faces a plane air space of ½" to 3½".

USG R.H. Base is a specially fortified large-size gypsum lath, used with DIAMOND Interior Finish in electric cable ceilings. Available 48" wide,

regular ½" or 5%" thick, FIRECODE Base ½" thick, 8 to 14-ft. lengths. Nailed or screw-applied to wood joists; screw-applied to USG metal furring channels or RC-1 resilient channels; joints reinforced with IMPERIAL glass fiber tape. System improves heat emission and resistance to heat deterioration. Meets NEC requirements. UL listed.



One-coat veneer plasters offer abrasion-resistant, hard surfaces ready for next-day decoration.



Screw-attached IMPERIAL Gypsum Base offers a high-strength base for veneer plasters.



Clip-attached ROCKLATH Plaster Base provides a superior surface for basecoat plaster.

2. USG Metal Lath

description

USG Metal Lath is sheet steel that has been slit and expanded to form a multitude of small mesh openings. It is made in Diamond Mesh, Riblath and Stuccomesh types and in two different weights for each style. They are manufactured from galvanized steel, or cold-rolled steel further protected by a coating of black asphaltum paint. Comply with Federal Specification QQ-L-101C.

Limitation: Metal Lath products should not be used with magnesium oxychloride cement stuccos or stuccos containing calcium chloride additives.

USG Junior Diamond Mesh Lath is a small diamond mesh metal plaster base (approx. 11,000 meshes per sq. yd.), a general all-purpose lath, best for ornamental, contour plastering. The small meshes conserve plaster and reduce droppings. Available painted and galvanized.

Also available in self-furring type having $\frac{1}{2}$ " "dimple" indentations spaced $\frac{1}{2}$ " o.c. each way for use as exterior stucco base, column fireproofing and for replastering over old surfaces. **Size:** 27" x 96". **Weights:** 2.5 lb. (end painted white) and 3.4 lb. (end ptd. red) per sq. yd.

USG Paper-Backed Metal Lath is painted or galvanized Junior Diamond Mesh Lath with asphalt-impregnated paper factory-bonded to the back. Ideal lath for machine-applied stucco in curtain walls and portland cement plaster setting bed for ceramic tile. Paper conforms to Federal Specification UU-B-790a, type I, grade D, style 2. Size: 27"x96". Weight: 2.5 lb. (end painted white) and 3.4 lb. (end ptd. red) per sq. yd.

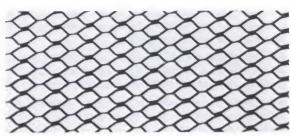
USG 4-Mesh Z-Riblath is a "flat rib" type of lath with smaller mesh openings, suitable for "double-up" type of plastering. An excellent nail-on lath, or for tie-on work on flat ceilings. **Size:** 27" x 96". **Weights:** 2.75 lb. (end painted white) and 3.4 lb. (end painted red) per sq. yd. **Limitation:** not for contour lathing; Diamond Mesh preferred.

USG %" Riblath comes in a herringbone mesh pattern with %" V-shaped ribs running lengthwise of the sheet at 4½" intervals, with inverted intermediate 3/16" ribs. The heavy ribs provide exceptional rigidity. Used when supports are spaced not more than 24" o.c. and for 2" solid studless metal lath and plaster partitions. Also used as a centering lath for concrete floor and roof slabs. Available painted and galvanized. Size: 27" x 96" (other lengths available). Weight: 3.4 lb. (end painted red) per sq. yd. Limitation: its extreme rigidity makes %" Riblath unsuitable for contour plastering—use Diamond Mesh Lath.

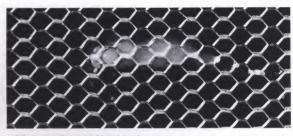
USG Expanded Metal Stuccomesh is a 1%" x 3%" diamond mesh pattern designed as a base for exterior stucco, hand or pump applied.



Size: $48'' \times 96''$. **Weight:** 3.6 lb. per sq. yd. **Limitations:** should be furred $\frac{1}{2}$ from sheathing and applied to wood framing with $\frac{1}{2}$ galvanized nails; when used over sheathing other than wood, fasten with longer nails providing minimum penetration of $\frac{1}{2}$ into studs.



USG Junior Diamond Mesh Lath



USG Paper-Backed Metal Lath



USG 4-Mesh Z-Riblati



USG 3/8" Riblath



USG Self-Furring Diamond Mesh Lath

3. USG Corner Beads, Trim, Control Joints description

USG Corner Beads and Trim, made from top-quality galvanized steel, enjoy the industry's top acceptance because of their dependability and continual improvement in design. Corner beads are available in 8 and 10-ft. lengths, metal trim in 7 and 10-ft. lengths, casing beads in 7, 8 and 10-ft. lengths.

1-A Expanded Corner Bead has 2% wide expanded flanges that are easily flexed. Preferred for irregular corners. Provides increased reinforcement close to nose of bead.

X-2 Corner Bead has full 31/4" flanges easily adjusted for plaster depth on columns. Ideal for finishing corners of structural tile and rough masonry. Has perforated stiffening ribs along expanded flange.

4-A Flexible Corner Bead is an economical general purpose bead. By snipping flanges, this bead may be bent to any curved design (for archways, telephone niches, etc.).

800 Corner Bead gives $^{1}/_{16}"$ grounds needed for one-coat veneer finishes. Approx. 90 keys per lin. in. provide superior bonding and strong, secure corners. The $^{11}/_{4}"$ fine-mesh flange eliminates shadowing, is easily nailed or stapled.

900 Corner Bead is used with two-coat veneer systems, gives $^{3}/_{32}$ '' grounds. Its $11/_{4}$ '' fine-mesh flange can be either stapled or nailed. Provides superior plaster key and eliminates shadowing.

Cornerite and Striplath are strips of painted Diamond Mesh Lath used as reinforcement. Cornerite is bent lengthwise in the center to form a 100° angle. It should be used in all interior angles where metal lath is not lapped or carried around, over non-ferrous lath anchored to the lath, and over internal angles of masonry constructions to reduce plaster cracking. Sizes: 2" x 2" x 96" and 3" x 3" x 96". Striplath is a similar flat strip, used as a plaster reinforcement over joints of non-metallic lathing bases and where dissimilar bases join; also to span pipe chases. Size: 4" x 96".

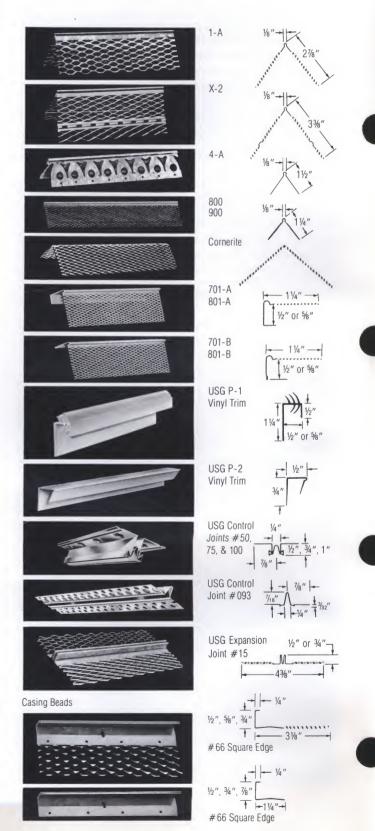
USG Metal Trim comes in two styles and two grounds to provide neat edge protection for veneer finishing at cased openings and ceiling or wall intersections. All have fine-mesh expanded flanges to strengthen plaster bond and eliminate shadowing. No. 701-A, channel-type, and No. 701-B, angle edge trim, provide 3/32" grounds for two-coat systems. No. 801-A, channel-type, and No. 801-B, angle edge trim, provide 1/16" grounds for one-coat systems. Sizes: for 1/2" and 5/8" IMPERIAL Gypsum Base.

USG P-1 Vinyl Trim is a channel-shaped rigid trim with flexible vinyl fins which compress on installation to provide a positive acoustical seal comparable in performance to one bead of acoustical sealant. For veneer finish partition perimeters. **Lengths:** 8, 9 and 10 ft. **Sizes:** for ½" and ½" gypsum base.

USG P-2 Vinyl Trim is a channel-shaped vinyl trim with a pressure-sensitive adhesive backing for attachment to the wall at wall-ceiling intersections. Provides positive perimeter relief in radiant heat and veneer finish systems. Allow 1/8" to 1/4" clear space for insertion. **Length:** 10 ft.

USG Control Joint relieves stresses of expansion and contraction in large plastered areas. Made from roll-formed zinc, it is resistant to corrosion in both interior and exterior uses with gypsum or portland cement plaster. An open slot, 1/4" wide and 1/2" deep, is protected with plastic tape which is removed after plastering is completed. The perforated short flanges are wire-tied to metal lath, screwed or stapled to gypsum lath. Thus the plaster is key-locked to the control joint, which not only provides plastering grounds but can also be used to create decorative panel designs. **Limitations:** Where sound and/or fire ratings are prime considerations, adequate protection must be provided behind the control joint. **USG Control Joints should not be**

used with magnesium oxychloride cement stuccos or stuccos containing calcium chloride additives. Sizes and grounds: No. 50, ½"; No. 75, ¾"; No. 100, 1" (for exterior stucco curtain walls)—10-ft. lengths.



USG Control Joint No. 093 applies the same functions of the regular control joint (see page 4) to veneer finish installations. Made of zinc, with $^{3}/_{32}$ " ground dimension and tape-protected $^{1}/_{4}$ " opening $^{7}/_{16}$ " deep. Used from floor to ceiling in long partition runs, and from header to ceiling above door frames. **Length:** 10 ft.

No. 15 Expansion Joint provides stress relief to control cracking in large plastered areas. Made with expanded flanges of galvanized steel or zinc in ½" and ¾" grounds. **Length:** 10 ft.

USG Casing Beads are used as a plaster stop and as exposed trim around window and door openings; also recommended at junction or intersection of plaster and other wall or ceiling finishes. May be used with USG Metal Lath, ROCKLATH Plaster Base, or masonry construction. In order to insure proper grounds for plastering, ¾" casing beads are recommended for use with metal lath, 5%" beads with all masonry units, 7%" beads when the flange is applied *under* ROCKLATH Plaster Base, ½" beads when the flange is applied *over* ROCKLATH Base. Available in #66 Square Edge with 11¼" solid flange in ½", ¾" and 7%" sizes. Expanded type with 31%" flange comes in ½", 5%" and 3¼" beads. Made from galvanized steel or zinc alloy for exterior applications.

IMPERIAL Tape is a special glass fiber open-weave tape designed to reinforce joints of large-size IMPERIAL and USG R. H. Bases prior to veneer finishing. Open weave of tape allows rapid air escape during embedding; highly crack resistant. Two types: P, pressure-sensitive, and S, staple-attached.

4. USG Lath Attachment Accessories

description

A complete line of specially formed steel clips and self-drilling steel screws provides positive attachment and rapid erection of gypsum plaster bases and metal lath. Variations are used with different U.S.G. partition and ceiling systems.

Bridjoint Field Clip B-1 is used to support and align end joints of lath which do not fall opposite structural members; for %" lath.

BRACE-TITE Field Clip BT-1 is used for suspended ceilings, exterior wall and beam furring and hollow pipe chase partitions. Provides support across full width of lath. For use with standard ¾" cold-rolled channels spaced 16" o.c.

BRACE-TITE Starter Clip BT-1 is used in conjunction with BT-1 field clip to start first course of lath.

TRUS-LOK Field Clip TL-1 is designed for attaching %" ROCKLATH Plaster Base to TRUSSTEEL Studs.

TRUS-LOK Starter Clip TL-2 is used with TL-1 clips, MS-1 clips and runner track to start first course of lath.

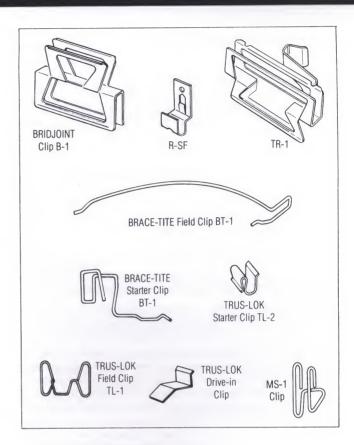
TRUS-LOK Drive-In Clip is used to anchor (1) bottom course of lath in direct attachment to TRUSSTEEL Studs, and (2) top course of lath in partitions to underside of monolithic concrete flat slab or concrete joist filler construction; also as starter-finisher clip in Steel Stud-ROCKLATH Plaster Base Partition.

MS-1 Clip provides quick direct attachment of %" ROCKLATH Base to channel-type USG Steel Studs. Clip is slipped behind stud flange and down over lath.

Resilient Clip TR-1 attaches %" ROCKLATH Base to TRUSSTEEL Studs spaced 16" o.c., furs lath %" from stud face.

Resilient Starter-Finisher Clip R-SF is used with starting and last courses of resiliently attached ROCKLATH Plaster Base on wood studs or TRUSSTEEL Snap-in Runner Track.

USG Screws are recommended for mechanical attachment of large size IMPERIAL and USG R. H. Bases, as well as, ROCKLATH Plaster Base in many applications. A complete line of special self-drilling, self-tapping steel screws is available including types with a double-thread



design which produces up to 30% faster penetration, less screw stripping, and greater holding power than conventional fasteners. Screws are highly corrosion-resistant and applied by power-driven screwgun. In exterior curtain walls, specify cadmium-plated screws. They comply with ASTM C646. Applications are listed below.

USG Screws—size & type	fastening applications
1", 1 ⁵ / ₁₆ " and 1%" Type S— Bugle Head	Single and double-layer IMPERIAL Base and ROCKLATH Base to steel studs, metal furring; (1" screw only) IMPERIAL and USG R.H. Bases to RC-1 Resilient Channel
11/4", 17/6", 21/4" & 25/6" Type S—Bugle Head	Core units and face-layer IMPERIAL Base to steel runners in caged beam fireproofing
1", 1¼", 15%", 17%", 2", 23%", 25%" and 3" Type S-12—Bugle Head	Gypsum sheathing and IMPERIAL Base to steel studs in curtain wall assemblies.
11/4" Type S-12 —Pancake Head	Metal lath and brick ties over gypsum sheathing to steel framing in curtain wall assemblies
1", 1%" & 21/4" Type S and S-12 —Trim Head	Wood trim over single and double-layer IMPERIAL Base to steel studs and runners
%" Type S—Pan Head	Steel studs to steel runners
3/8", 1/2" Type S-12—Pan Head	Steel studs to runners, metal door frame
%" Type S-12—Low- profile Head	Steel-to-steel attachment up to 14-ga. in curtain walls and steel framing systems
11/4", 15%", 21/4" Type S—Oval Head	Cabinets to steel studs and RC-1 Resilient Channel
11/4" Type W or S—Bugle Head	Single-layer IMPERIAL and USG R.H. Bases to wood framing; RC-1 Channels to wood framing
11/2" Type G—Bugle Head	Face-layer IMPERIAL Base to base-layer IMPERIAL Base in laminated partitions

5. USG Structural Accessories

description

U.S.G. leads the industry in the development and acceptance of structural components for plastering systems. Included are non-load bearing studs of the truss and channel types, runner tracks, shoes and screws as needed; furring and lathing channels, and an adjustable wall furring bracket.

TRUSSTEEL Studs are used for framing hollow, fire-resistant partitions and curtain walls. They are formed from cold-drawn 7-ga. steel wire rods with tensile strength of 90,000 psi. A continuous diagonal wire web is welded to double wire flanges to provide an open-web design that readily accommodates pipes, conduits and ducts without impairing the partition's strength. Fabricated in five stud widths: 15/8", 21/2", 31/4", 4" and 6", factory-cut to job lengths.

TRUSSTEEL Snap-In Runner Track anchors the partition, permits stud to snap into place eliminating the need for stud shoes. When this track serves as a ceiling runner, stud shoes are used if a fire rating is required. Available for all except 6" width of studs; 10-ft, lengths.

TRUSSTEEL Runner Track is used with TRUSSTEEL Stud Shoes to anchor the partition at floor and ceiling, particularly where floor-to-ceiling height varies. Available for all stud widths; 10-ft. lengths.

TRUSSTEEL Stud Shoes, 7" long and made from 24-ga. steel, are used to connect studs to runner track. Permit up to 4" adjustment in partition height.

Design Data—TRUSSTEEL Studs

		_			
stud size—(widths)	15/8″	21/2"	31/4"	4"	6"
weight—(lb. per 1000 ft.)	440	455	470	485	515
deflection(1)	.355″	.168"	.117"	.094"	.072
gauge	7-ga. (dia	ameter .177")	chords and	diagonals	
tensile strength	85,000 p	si—yield poi	nt		
percent of open area	67%	79%	84%	87%	91%

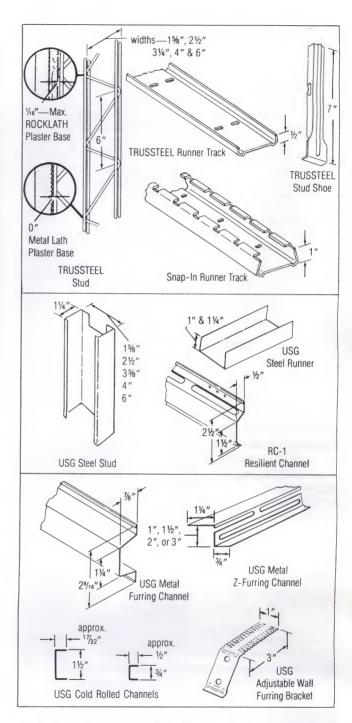
⁽¹⁾ Deflections of TRUSSTEEL Studs with 100-lb. concentrated load in a 5-ft. span are below the maximum allowable deflections of .20" for 2½" studs, .15" for 3½" studs, and .10" for 4" and wider studs specified in the requirements of the United States Corps of Engineers, General Services Administration, and Veterans Administration.

Structural Properties—TRUSSTEEL Studs

	major ax	is		minor ax	s	
stud size	I _x in ⁴	S _x in ³	r _x in	l _y in ³	S _y in ³	r _y in
15/8"	0.052	0.064	0.725	.0033	.0123	.1824
21/2"	0.132	0.106	1.162	.0033	.0123	.1824
31/4"	0.231	0.142	1.537	.0033	.0123	.1824
4"	0.365	0.183	1.916	.0033	.0123	.1824
6"	0.831	0.277	2.912	.0033	.0123	.1824

USG Steel Studs and Runners, channel-type and roll-formed from corrosion-resistant steel, are used in non-load bearing interior partition and exterior curtain wall systems. The secure, rigid screw or clip attachment of the gypsum base utilizes the full structural contribution of the lath and plaster membrane. Limited chaseways are provided by punchouts in the web. Assemblies using these studs are low in cost with excellent sound and fire-resistance characteristics. Available in various styles and widths to meet functional requirements outlined below:

Interior Partitions, Ceilings, Column Fireproofing-ST, STL and



CWS stud styles in five widths—15%", 21/2", 35%", 4", 6"—and 8 to 16-ft. lengths. Runners in stud widths 10-ft. lengths.

Exterior Curtain Wall—studs are available in various styles to meet height requirements and in six widths—2½", 3½", 35%", 4", 5½", 6"—lengths up to 28 ft. Runners in stud widths (with 1" or 1¼" unhemmed leg), 10-ft. lengths.

Studs and Runners, styles ST, STL, CR, CRL, CWS and CWR, are made from steel having 33 ksi min. yield strength. Except for STL and CRL they comply with ASTM C645. Corrosion-resistant coatings are hot-dip galvanized per ASTM A525, aluminized per ASTM A463 or 55% aluminum-zinc.

USG Metal Furring Channel is a roll-formed, galvanized steel ceiling and wall channel for screw attachment of ROCKLATH and IMPERIAL Bases. Product complies with ASTM C645.

RC-1 Resilient Channel is a galvanized steel channel for resilient attachment of IMPERIAL and USG R.H. Bases to wood framing. One of the most effective, lowest-cost methods for improving sound control. Flange is prepunched for screw fastening to framing. Base is screw-attached to channel.

USG Z-Furring Channel is used to attach mineral-fiber and Foamular polystyrene insulations and IMPERIAL Base to interior of masonry walls. Made of hot-dip galvanized steel. Suitable for 1" to 3" thick insulation.

USG Adjustable Wall Furring Brackets are used to attach framing to exterior masonry walls in braced furring systems. Made of 20-ga. galvanized steel, they are attached to steel studs or horizontal channel stiffeners. Furring depth: up to 21/4" plus stud width.

USG Cold Rolled Channels are roll-formed 16-ga. steel, galvanized or black asphaltum painted; used for furring, suspended ceilings, partitions, ornamental lathing. **Sizes:** 3/4", 11/2"; 16 and 20-ft. length.

6. Veneer Finishes

IMPERIAL Plasters are interior products that trim days from plaster finishing schedules and provide exceptionally high strength and abrasion resistance (3,000 psi). The applied cost averages only slightly above conventional drywall cost. Applied to thickness of $^{1}/_{16}''$ to $^{3}/_{32}''$; require only the addition of clean water. They qualify for ratings of up to two hours and 53 STC in steel and wood-frame assemblies. Comply with ASTM C587 and Federal Specification SS-P-00402B, Type VI. Available in two types:

IMPERIAL Finish—for single-coat application composed of scratch coat and immediate doubling back directly over special IMPERIAL Gypsum Base, glass-fiber tape and special corner bead or over IMPERIAL Basecoat in two-coat system. Provides a smooth trowel, or float finish for decoration.

IMPERIAL Basecoat—for use where two-coat application and a high-strength conventional finish are preferred. Can be applied to either IMPERIAL Gypsum Base, directly to concrete block or over a bonding agent on monolithic concrete. Formulated to receive IMPERIAL Finish, DIAMOND Interior Finish, RED TOP Finish, gauged lime putty, STRUCTO-GAUGE-lime-sand float finishes.

Basecoat is available in machine and hand-applied formulations; Finish for hand application only. Machine-application basecoat is spray-applied in a patented process. Machine application trowel-finish is not recommended.

DIAMOND Interior Finish is a white finish formulated for hand application directly to IMPERIAL Gypsum Base or over a bonding agent on monolithic concrete. Also suitable in a two-coat system over IMPERIAL Basecoat or a sanded gypsum basecoat. Applied to a nom. $^{1}/_{16}$ " thickness, this finish is *unaggregated* for a smooth or skip-trowel finish; may be aggregated for float or other textures; must be aggregated with one-half to one part fine silica sand for application to monolithic concrete. Fast-applying; under ideal drying conditions, can be decorated in 24 hours with breather-type paint. Not recommended for use over portland cement basecoat or masonry surfaces.

Should be applied to IMPERIAL Gypsum Base having blue face paper. Faded base should be treated with alum solution before finish is applied to prevent possible bond failure. See U.S.G. Bulletin P-529 for specifics. Complies with ASTM C587 and Federal Specification SS-P-00402B, Type VI.

DIAMOND Interior Finish is also suitable for use with electric cable ceilings. Allows higher operating temperatures than with other pro-

ducts, provides more heat transmission and greater resistance to heat deterioration. Fill coat is job-sanded and hand-applied $^{3}/_{16}''$ thick to cover cable. A finish coat of the same material is applied $^{1}/_{16}''$ to $^{3}/_{32}''$ thick to bring the total plaster thickness to $^{1}/_{4}''$. Applied over special USG R.H. Base attached to wood joists, to metal furring channel or suspended metal grillage; or over a bonding agent directly to monolithic concrete ceilings to a total thickness of $^{3}/_{4}''$.

7. Basecoat Plasters

description

USG Basecoat Plasters can be applied by either hand or machine methods, on gypsum or metal lath; gypsum or clay tile; concrete or cinder blocks, or other approved plaster bases.

limitations

- 1. Where sound isolation is the prime consideration, use sand aggregate only.
- 2. Over interior monolithic concrete, a high-quality plaster bonding agent should be applied before plastering.
- 3. Gypsum plasters should not be used where they will come in contact with water or excessive moisture. They may be applied to exterior soffits that are protected from direct exposure to rain and moisture, and have suitable drips and casings provided along edges.
- **4.** Plaster application on masonry or concrete walls, or ceilings that have been coated with bituminous compounds or other waterproofing agents, is not recommended. Exterior walls should be furred and lathed prior to plastering to prevent seepage and condensation.
- 5. The only U.S.G. plaster recommended for the embedment of electric heat cables is job-sanded DIAMOND Interior Finish backed by USG R.H. Base or applied directly to properly prepared monolithic concrete.





(Above) Finish plaster ready for application.

(Left) Test demonstrates IMPERIAL Plaster's superior abrasion resistance. When scoured 250 times by a 25-lb. weighted brush, penetration into the finish was never more than one millimeter.



RED TOP Wood Fiber Plaster is a gypsum plaster containing fine particles of selected wood fiber. It normally requires the addition of water only; however, when used over masonry plaster bases or for machine application, 1 cu. ft. of sand per 100 lb. of plaster must be added, and when used as a scratch or brown coat, 1 cu. ft. of sand may be added. Wood fiber plaster can be applied to all standard lath and masonry plaster bases; strongly recommended as a scratch coat for metal lath. Complies with ASTM C28 and Federal Specification SS-P-00402B Type III.

RED TOP Gypsum Plaster is a gypsum basecoat requiring the addition of aggregate and water on the job. Supplied in three types: *Regular*—for sand aggregate, hand application: *LW*—for lightweight aggregate, hand application; *Machine Application*—for sand or lightweight aggregate. Complies with ASTM C28 and Federal Specification No. SS-P-00402B, Type II. **Limitation:** perlite aggregate not recommended when machine applied, with vertical lift over 30 ft. or hose length over 150 ft.

RED ToP Two-Purpose Plaster is a gypsum basecoat requiring the addition of aggregate and water on the job. Suitable for either hand or machine application and use with sand or lightweight aggregate meeting ASTM C35. Two-Purpose Plaster complies with ASTM C28 and Federal Specification No. SS-P-00402B, Type II. **Limitation:** perlite aggregate not recommended when machine applied, with vertical lift over 30 ft. or hose length over 150 ft.

STRUCTO-BASE Gypsum Plaster is a special gypsum basecoat plaster that develops higher strengths than conventional plasters. Recommended for handball courts, hospital corridors, schools, etc., wherever a high-strength basecoat plaster is necessary. Complies with Federal Specification SS-P-00402B, Type II, and ASTM C28 for "gypsum neat plaster" including the added requirement of 2,800 psi compressive strength.

STRUCTO-LITE Gypsum Plaster is a mill-mixed perlite-aggregated gypsum plaster which requires the addition of only water at the job site. It is formulated in three types: *Regular*—for use over gypsum or metal lath; *Masonry*—for use on high suction unit masonry base only; *Type S*—for specific UL-listed assemblies.

STRUCTO-LITE Plaster weighs less than half as much as sanded basecoat; has a "k" factor of 1.74, providing three times the insulation value of sanded plaster. Overall cost is comparable to job-mixed lightweight aggregate plaster. Complies with Federal Specification SS-P-00402B, Type I and ASTM C28 for gypsum ready-mixed plaster. Limitations: (1) Not recommended over metal lath when a smooth trowel lime finish is to be used. It may be sand-float finished, or used as a base for acoustical tile. (2) Not recommended for machine application with vertical lift over 30 ft. or hose length over 150 ft.

Portland Cement-Lime Plaster is used for interior applications where high-moisture conditions exist, or for exterior stucco. Prepared as follows:

Job-mixed Stucco—Mix Bondcrete or Mortaseal Mason's Lime with portland cement and sand in accordance with ANSI A42.2, Type L. Suggested proportions: scratch coat—1 bag portland cement, ¾ to 1 bag lime, 5 to 6 cu. ft. sand; brown coat—1 bag portland cement, 1 bag lime, 6 to 7 cu. ft. sand; finish coat—1 bag portland cement, 2 bags lime, 7 to 10 cu. ft. sand.

Prepared Finish—ORIENTAL Exterior Finish Stucco (mill-mixed), a white float or texture finish.

Limitations of portland cement plaster: (1) Scratch, brown and finish coats require curing with water after set; (2) Must not be applied directly to smooth, dense surfaces, gypsum lath or gypsum block. Self-furring metal lath must be secured to such surfaces before plaster is applied; (3) Control joints should be provided to compensate for shrinkage during drying; (4) A Keenes cement-lime putty finish must never be used over a portland cement basecoat.

Technical Data—Basecoat Plasters

plaster product		ratio: aggre- gate (vol.) basecoat (wt.)		approx. compressive strength dry(1)		weight	conduc-
	mix	ft³/100 lb	m³/t	lb/in²	kg/ cm²	—dry	(k)
STRUCTO-LITE RED TOP Wood	regular	-	-	700	49	50	1.74
Fiber RED TOP Wood	neat	_	-	1750	123	82	3.15
Fiber	sand	1.0	0.62	1400	98	97	_
STRUCTO-BASE	sand	2.0	1.24	2800 min.	197	124	_
	sand sand	2.5 3.0	1.55	1900 min. 1400 min.	134 98	120 118	_
RED TOP Gypsum	sand	2.0	1.24	875	62	107	5.51
and Two-Purpose Plasters	sand sand	2.5 3.0	1.55 1.86	750 650	53 46	108 109	5.60
	perlite perlite	2.0	1.24 1.86	700 525	49 37	48 41	1.64 1.31
	vermiculite vermiculite	2.0	1.24 1.86	465 290	33 20	48 41	1.74 1.42

(1)Average laboratory results when tested in accordance with ASTM C472. Figures may vary slightly for products from individual plants.

Use of Aggregates with Gypsum Plasters

maximum recommended proportions

			maximum aggregate quantity, cu. ft., to be used with 100 lb. of neat gypsum plaster									
			under :				under finishe		е			
		tunn	sand (1	1)	perlite (2)		sand (1)	perlite (2)			
plaster base	no. of coats	type of coats	ft ³ / 100 lb	m³/t	ft ³ / 100 lb	m³/t	ft ³ / 100 lb	m³/t	ft ³ / 100 lb	m³/t		
gypsum lath	3	scratch brown	2 3	1.24 1.86	2 2	1.24 1.24	2 3	1.24 1.86	2 3(3)	1.24 1.86(3		
	2	basecoat	2.5	1.55	2	1.24	2.5	1.55	2	1.24		
metal lath	3	scratch brown	2 3	1.24 1.86	_	_	2 3	1.24 1.86	2	1.24 1.24		
unit masonry	3	scratch brown	3	1.86 1.86	3	1.86 1.86	3	1.86 1.86	3	1.86 1.86		
	2	basecoat	3	1.86	3	1.86	3	1.86	3	1.86		

⁽¹⁾ Approximately six No. 2 shovels of sand equal 1 cu. ft. (0.028m³). (2) In a construction with metal lath as the plaster base, perlite or vermiculite aggregate is not recommended for use in the basecoat plaster, unless a float finish is used. (3) Quantity recommended only if plaster is applied 1" thick, otherwise use 2 ft.³.

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Thermal Coefficient of Expansion (unrestrained)

[Inches/inch/°F. (40°—100°F.)]

Sanded Gypsum Plaster (100:2, 100:3)	7.0×10^6
Wood Fiber Plaster (sanded 100:1)	8.0x10 [∞]
Gypsum Lath	9.0x10 ⁶

Hygrometric Coefficient of Expansion (unrestrained)

[Inches/Inch/%R.H. (5%-90%R.H.)]

$7.2x10^6$
1.5x10 ⁶
4.8x10 ⁶
3.8x10 ⁶
2.8x10 ⁶

8. Finish Coat Plasters

description

There are several types of finish plasters; some require the addition of water only, and others are a blend of gypsum, lime and water, or gypsum, lime, sand and water.

Since the finish coat must be compatible with the basecoat, care must be taken in the selection of the finish coat materials in relationship with the characteristics of the basecoat. See Application Data and limitations below.

limitations

1. A smooth trowel finish should not be used over lightweight aggre-

gate gypsum basecoat applied over metal lath. A sand float finish is recommended.

- 2. Where the gypsum basecoat is STRUCTO-LITE brand or contains lightweight aggregate (perlite or vermiculite) is applied over any plaster base except metal lath and a smooth trowel finish is used, the finish coat should be RED TOP Gauging Plaster and lime, with addition of ½ cu. ft. of perlite finesor 50 lb. of No. 1 white silica sand per 100 lb. gauging plaster, or a factory-aggregated, Quality, gauging plaster.
- 3. Gypsum or lime base finishes, including Keenes cement, should not be used directly over a portland cement basecoat or over concrete block or other masonry surfaces.
- 4. In smooth trowel finishes, gauging plasters providing an extremely hard surface, such as STRUCTO-GAUGE Gauging Plaster and Keenes cement, must not be used over STRUCTO-LITE Plaster or a basecoat with a lightweight aggregate.

ORIENTAL Exterior Stucco Finish is a mill-prepared, water-resistant finish to use over portland cement-lime basecoats only. Requires addition of water only. Float, texture, stipple, sponge, spatter-dash or rough coat finishes may be used; not designed for smooth trowel finish. Available in white for hand or spray application.

RED TOP Finish is a mill-mixed, gauged interior finish requiring addition of water only. Has stabilized set, excellent troweling characteristics. Two formulations available: *Regular Set*, for use over conventional sanded gypsum basecoat, and *Quick Set*, for use of IMPERIAL Basecoat. **Limitation**: not for use over lightweight aggregate gypsum basecoat.

Application Data—USG Interior Finish Coat Plasters

			hardness-	-lb. (1)			
description	finish texture	gauging-lime- sand mix	regular	quick trowel	comments		
STRUCTO-GAUGE Gauging & Lime Putty	Smooth Trowel	1:1:0	236(2)		Use for high-traffic areas over high-strength wood fiber or sanded gypsum basecoats. For handball courts, use over STRUCTO-BASE Basecoat.		
		1:2:0	106(2)		Use for durability and abuse-resistance over wood fiber, sanded gypsum or IMPERIAL Basecoat.		
RED TOP Keenes Cement &	Smooth Trowel	4:1:0	88(2)	139(2)	Offers strong, hard surfaces when densified by extensive troweling through set. Use over high-strength gypsum basecoat.		
Lime Putty		2:1:0	75(2)	112(2)	May be retempered; permits mixing large batches.		
	Float Finish	2:1:8	_	-	Commonly used float finish, may be satisfactorily job-colored.		
Regular Gauging & Lime Putty	Smooth Trowel	1:2:0	75(2)	-	For normal use; over lightweight aggregate basecoat, add ½ cu. ft. of perlite fines or 50 lb. of # 1 silica sand per 100 lb. gauging.		
Lime Futty	Float Finish	1:2:8	_		For normal use over any basecoat.		
IMPERIAL Finish	Smooth Trowel or Float Finish	neat	119(3)		Highly abrasion resistant, hard surface for use over IMPERIAL Basecoat and IMPERIAL Gypsum Base.		
DIAMOND Interior Finish	Smooth Trowel or Float Finish	neat	94(2)(3)	_	Offers harder, more abrasion resistant surfaces than regular gauging and lime putty. Formulation resists heat deterioration For use over RED TOP Radiant Heat Base.		
RED TOP Finish	Smooth Trowel	neat		_	For hard-wear interiors over conventional sanded basecoat or IMPERIAL Basecoat.		

(1)Pounds required to force a 10-mm dia. steel ball .01" into plaster face. (2) Avg. tested values when applied over a sanded gypsum basecoat. (3) Avg. tested values when applied over veneer basecoat.

gauging plasters (for blending with lime putty)

STRUCTO-GAUGE Gauging Plaster is high-strength gypsum gauging plaster that provides extreme hardness, resistance to surface abrasion; Quick or Slow Set. Used only over a high-strength base-coat—wood fiber, sanded gypsum, STRUCTO-BASE or IMPERIAL Basecoat. Complies with ASTM C28 and Federal Specification SS-P-00402B, Type V, with the added requirement of 5,000 psi compressive strength (neat).

RED Top Keenes Cement—A dead-burned gypsum gauging, which requires extensive troweling except in regular sand float finishes. This troweling densifies the surface for hardness and resistance to surface abrasion. The only retemperable gypsum plaster. Ideal for float finishes and for job coloring. Complies with ASTM C61 and Federal Specification SS-C-161A Type I (Regular), II (Quick Troweling).

CHAMPION and STAR White Gauging Plaster—These are conventional quick and slow-set gauging plasters available **Unaggregated**, for use over sanded basecoats or **Quality**, with perlite fines, for use over lightweight aggregated basecoats. Comply with ASTM C28 and Federal Specification SS-P-00402B, Type V.

RED TOP Gauging Plaster—Similar to CHAMPION and STAR Plasters except it comes in a slightly darker color. Available in **Regular**, unaggregated and **Quality**, with perlite fines added. Complies with ASTM C28 and Federal Specification SS-P-00402B, Type V.

finishing limes

IVORY and SNOWDRIFT Finish Limes—Autoclaved—Products are 92% hydrated finishing limes. Do not require soaking, and virtually eliminate the possibility of future expansion within the finish coat because of unhydrated magnesium oxides. Comply with ASTM C206, Type S, and Federal Specification SS-L-351B, Type F.

RED TOP and Grand Prize Normal Hydrate Finish Limes—Hydrate limes which require soaking at least 16 hours to develop proper plasticity and the degree of hydration necessary prior to use. Comply with ASTM C6, Type N, and Federal Specification SS-L-351B, Type F.

9. Special Plasters

USG Moulding Plaster is used in specialized work such as cast ornamental enrichments or running cornices. The grind is conducive to fine detail; controlled set helps obtain exact reproduction. Available in white and grey colors. Complies with ASTM C28 and Federal Specification SS-P-00402B, Type V.

White HYDROCAL Gypsum Cement has exceptional strength and produces fine detail in ornamental work. Recommended for thin sections and castings made from intricate latex molds.

related insulation products

THERMAFIBER Insulation is a mineral-fiber product for improving sound control in partition and floor-ceiling constructions and thermal resistance in exterior walls. **Sound Attenuation Blankets**, paperless, semi-rigid mats, improve STC ratings when installed in USG steel stud partitions and wood frame construction. **M-S Blankets** insulate exterior curtain wall assemblies. They are flangeless, open-faced on breather side and require separate vapor barrier. Fire-resistant **Z-Furring Blankets** provide noncombustible exterior wall furring assemblies (see Folder SA-705).

FOAMULAR Polystyrene Insulation, an extruded foam panel, provides exceptional water-resistance for predictable insulating values. Used as insulating sheathing in 1-hour fire-rated, steel or wood-frame exterior walls; as foundation and masonry cavity wall insulation; and in Z-furring systems for insulating exterior walls (see Folder SA-710).

general lathing and plastering specifications

notes to architect

- 1. Specifications following are minimum basic guides for preparation of job specifications. They are for normal construction and are not intended to cover every possible design or job condition.
- 2. Zinc alloy accessories are recommended where corrosion due to high humidity and saline content of aggregate is possible. USG Metal Lath, Control Joints and other USG Metal Accessories, including zincalloy accessories, should not be used with magnesium oxychloride cement stuccos or portland cement stucco containing calcium chloride additives.
- **3. Additional Information**—see U.S.G. Construction Selector SA-100 in this series and in Sweet's General Building File for index to fire and sound-rated systems. Detailed specifications for the various assemblies are found in pertinent U.S.G. system folders.

Part 1: general

1.1 scope—Specify areas to receive this treatment.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials, except water and sand, shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

- a. In cold weather, all glazing shall be completed and the building heated to a minimum of 55°F. (13°C) before lath installation. Temperature of building shall be maintained in uniform range above 55°F. for an adequate period prior to application of plaster, while plastering is being done, and until plaster is dry. Heat shall be well distributed in all areas, with deflection or protective screens used to prevent concentrated or irregular heat on plaster areas near source. When required, heat shall be furnished by ().
- **b.** Ventilation shall be provided to properly dry conventional plaster during and subsequent to its application. In glazed buildings, this shall be accomplished by keeping windows open sufficiently to provide air circulation; in enclosed areas lacking normal ventilation, provisions must be made to mechanically remove moisture-laden air. For veneer plaster, a minimum ventilation level shall be maintained until the plaster has set and dried.
- c. If glazed sash are not in place and the building is subject to hot, dry winds or temperature differentials from day to night of 20°F. (11°C) or more, openings shall be screened with cheesecloth or similar material.

1.5 protection

Proper protection shall be provided during plastering for finished door and window frames and other designated areas which do not receive a plaster finish.

Part 2: products

2.1 lathing materials

a. Plaster Base: (ROCKLATH Plaster Base (thickness), (regular), (FIRECODE), (Foil-Back).)

(IMPERIAL Gypsum Base (thickness), (Regular) (FIRECODE) (FIRECODE "C").) Specify only with veneer plaster, #800 or #900 Corner Bead and IMPERIAL Joint Reinforcement Tape.

(USG Metal Lath (weight), (Junior Diamond Mesh) (Paper-Backed) (Z-Riblath) (%" Riblath) (Expanded Metal Stuccomesh).

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- **b. Reinforcement:** (USG 1-A, X-2, 4-A, #800, #900 Corner Bead, Cornerite, Striplath.)
- c. Control Joint: USG Control Joint (#50, #75, #100 or #093), #15 Expansion Joint.
- d. Casing Bead: (size) #66 USG Casing Bead or USG Metal Trim (701-A) (701-B) (801-A) (801-B).
- e. Lath Attachment Clips: (BRIDJOINT Clip B-1; BRACE-TITE Field Clip or Starter Clip BT-1; TRUS-LOK Field Clip TL-1; Starter Clip TL-2, Drive-In Clip TL; Field Clip MS-1; USG Resilient Clip TR-1 or R-SF).
- f. Screws: (1", 11/4", 15/16", 15/8", 17/8", 21/4", 29/8", 25/8" or 3" USG Type S or S-12, Bugle Head) (11/4" USG Type S-12, Pancake Head) (1", 15/8" or 21/4" USG Type S or S-12, Trim Head) (3/8" USG Type S Pan Head) (5/8" USG Type S-12, Low-profile Head) (11/4", 15/8" or 21/4" USG Type S, Oval Head) (11/4" USG Type W, Bugle Head) (11/2" USG Type G, Bugle Head).
- g. Furring Channels: (USG Metal Furring Channels) (USG Z-Furring Channels).
- h. Steel Studs: (size) (TRUSSTEEL Studs, used with TRUSSTEEL Snap-In or TRUSSTEEL Runner Track, TRUSSTEEL Stud Shoes) (USG Steel Studs, used with USG Steel Runner).
- i. Furring Brackets: USG Adjustable Wall Furring Brackets.
- j. Lathing Channels: USG Cold Rolled Channels (size).
- k. Resilient Channels: RC-1 Resilient Channels.

2.2 plastering materials

- a. Basecoat Plaster: (STRUCTO-BASE Gypsum Plaster) (RED TOP Wood Fiber Plaster) (RED TOP Gypsum Plaster) (RED TOP Two-Purpose Plaster) (STRUCTO-LITE Plaster) (IMPERIAL Basecoat).
- b. Aggregate: (Sand) (Perlite) meeting ASTM C35 requirement. Sand for float finishes shall be graded (white) silica sand passing a (30 mesh) (20 mesh) screen.
- Water: Potable and not contain impurities that affect the setting of gypsum.
- d. Finish Lime: (IVORY) (SNOWDRIFT) (GRAND PRIZE) (RED TOP).
- e. Gauging Plaster: (STRUCTO-GAUGE) (Keenes Cement) (STAR) (CHAMPION) (RED TOP) (Regular) (Quality).
- f. Prepared Finish: (IMPERIAL Finish Plaster) (DIAMOND Interior Finish) (RED TOP Finish).
- g. Exterior Stucco Finish: ORIENTAL Exterior Finish.
- h. Grout: (RED TOP Gypsum Plaster) (STRUCTO-LITE Basecoat).
- i. Plaster Ornaments and Mouldings: (USG Moulding Plaster) (White HYDROCAL Gypsum Cement).

2.3 mixes

- a. Basecoat Plaster (and Aggregate) shall be mixed in proportions of (specify from technical data, page 8).
- b. Finish Plaster shall be mixed in proportion by dry weight of ______ parts of gauging to ______ parts of lime (specify from application data, page 9), according to the manufacturer's directions. Over lightweight aggregate basecoats add ½ cu. ft. of perlite fines or 50 lb. of No. 1 silica sand per 100 lb. of gauging plaster, or use mill-aggregated gauging.
- c. Ivory or Snowdrift Lime shall be box-soaked or machine-mixed for immediate use with approx. $5\frac{1}{2}$ to 6 gal. water per 50-lb. bag.
- d. GRAND PRIZE or RED TOP Lime shall be box-soaked or machinemixed using approx. 6 gal. water per 50-lb. bag, and allowed to soak for 16 hours.

Part 3: execution

Refer to appropriate System Folders for detailed specifications on lathing and accessories application. For lathing and plastering specification for handball courts, refer to U.S.G. Bulletin PM-125.

3.1 control joint installation

Where indicated on drawings, attach USG Control Joints (size) with dry wall screws or Bostitch 9/16" "G" staples or equal spaced not over

- 6" apart in each flange. (Control Joints Nos. 50, 75, 100—splice ends together with 16-ga. tie wire inserted into openings in the key-lock sections.) (Control Joint No. 093—square-cut end joints, butt together and align for neat fit.) Remove protective tape after plastering.
- **a.** Interior Ceilings—space control joints not exceeding () ft. in either direction (see pertinent U.S.G. System Folders). Break lath behind control joints; where channel framing is used, also break the channels. Position control joints to intersect light fixtures, heating vents, air diffusers, etc.
- **b.** Interior Walls and Partitions—space control joints maximum of 30 ft. apart; control joints may occur over door frames as indicated in drawings.
- c. Exterior Soffits of Gypsum Plaster—space control joints not exceeding 25 ft. in either direction. Break lath and channel behind control joints. All other specifications listed above are applicable.
- d. Exterior Walls, Soffits and Canopies of Portland Cement Stucco—space control joints not exceeding 10 ft. in either direction. Where there is an intersection of vertical and horizontal joints, use continuous vertical joint and butt the horizontal joint. Caulk splices and intersections exposed to the elements with a silicone rubber caulking cement. In soffits and canopies, break lath and channel behind control joints.
- **3.2 plaster thicknesses** shall be as shown on plans; however, in no case shall the grounds be less than:

USG Metal Lath-5/8" (from face of lath)

ROCKLATH Plaster Base-1/2"

Masonry Units-5/8"

Monolithic Concrete Ceilings—1/8" (3/8" maximum)

Monolithic Concrete Walls—1/8" (5/8" maximum)

IMPERIAL Plasters—1/16" to 3/32" (over special gypsum base)

DIAMOND Interior Finish (for electrical cable ceilings)—3/8" (over special gypsum base or monolithic concrete)

- **3.3 basecoat application**—Mix basecoat plasters by hand or in a mechanical mixer to a uniform consistency following manufacturer's directions. Apply basecoat plaster by (hand) (machine) in (1) (2) coats. Monolithic or unit masonry surfaces that exhibit high suction shall be moderately wetted immediately before plastering.
- a. Two-coat work: Over gypsum lath and masonry, apply base (first) coat with sufficient material and pressure to form good bond to base and to cover well, and then double back to bring plaster out to grounds. Straighten to a true surface with rod and darby without use of additional water and leave rough to receive finish (second) coat.
- b. Three-coat work: Apply scratch (first) coat with sufficient material and pressure to form good full keys on metal lath, and good bond on other bases, and then cross-rake. Apply brown (second) coat after scratch (first) coat has set firm and hard. Bring out to grounds and straighten to a true surface with rod and darby without use of additional water. Leave rough to receive finish (third) coat.

3.4 special applications

- a. Solid Studless Metal Lath Partition: Apply scratch coat to side opposite bracing, and allow to set and partially dry. Then apply brown coat to side opposite braces, allowing it to set thoroughly before removing temporary braces. Next apply brown coat to previously braced side to bring plaster out to grounds. Straighten to a true surface with rod and darby without use of additional water, and leave rough to receive finish coat.
- b. Solid Channel Stud Metal Lath Partition: Apply scratch coat to lath side and allow to set and partially dry. Then apply back-up coat to channel side to full grounds, 1/2'' over channels, in not less than two operations; allow to set. Apply brown coat on lath side to bring plaster out to grounds. Straighten to a true surface with rod and darby without use of additional water, and leave rough ro receive finish coat.

- c. BRACE-TITE System Ceiling: The three-coat method is recommended. If the two-coat system is used, a minimum of 20 minutes must be allowed before doubling back and the setting time of the basecoat must not exceed 3 hours.
- **d. Monolithic concrete** to which a plaster bonding agent is to be applied shall be free of dirt, dust, grease, wax, oil or other unsound surface conditions. Laitance, efflorescence and parting compounds shall be chemically removed. Apply plaster bonding agent to concrete surface in a continuous film according to manufacturer's directions. Apply basecoat plaster by firmly grinding a thin coat into the bonding agent. Immediately double back to a completed thickness of 1/16" to 3/32" having a level surface ready for finish plaster application.
- e. Portland Cement Basecoats shall be proportioned (specify from page 8), and applied in two coats. Cross-rake scratch coat and after setting, damp-cure for not less than 48 hours. Damp-cure brown coat after setting for not less than 48 hours.
- **f. IMPERIAL Basecoat:** When applied directly over concrete block, fill all voids and depressions including joints; leave rough and allow to set prior to lime putty finish application. Spray concrete block uniformly with water immediately before applying IMPERIAL Basecoat. Cover monolithic concrete surfaces with an application of plaster bonding agent prior to plastering. RED TOP Accelerator may be used to quicken set. Total basecoat shall be $^{1}/_{16}"$ to $^{3}/_{32}"$ thick.
- g. IMPERIAL Basecoat: When applied directly to IMPERIAL Gypsum Base, embed tape and fill beads, and allow plaster to set; then scratch and immediately double back to a thickness of 1/16" to 3/32", in accordance with manufacturer's directions.
- h. Where plaster is flush with metal base, metal door frames, etc., groove at the junction to reduce the possibility of chipping. Cut basecoat plaster free from these metal sections before plaster sets.
- Grout all steel door frames in solid plaster and steel stud partitions prior to lathing.

3.5 finish coat application

- a. Trowel Finish Coats: Scratch plaster in thoroughly and immediately double back to fill out to a smooth, dense surface for decoration, free of surface blemishes and irregularities. Apply finish coat as thin as possible, preferably 1/16" to not more than 1/6" maximum thickness. Trowel Keenes Cement Finishes until the material sets.
- b. Float Finish Coats: Scratch plaster in thoroughly and immediately double back to a true, even surface. Float using a (shingle) (cork) (wood) (carpet) or (rubber) float to bring aggregate to the surface to produce a finish of uniform texture free of slick spots, cat faces and other blemishes. Use water sparingly in natural color, and no water on colored finishes. With ORIENTAL Exterior Stucco Finish, use no water in floating or texturing. Fog-spray surface with water for several days after setting.
- c. Machine-Applied Spray Finishes: Apply plaster uniformly to produce a texture approved by the architect.
- **d. IMPERIAL Finish:** Over IMPERIAL Gypsum Base embed tape, fill beads and allow to set; then scratch and immediately double back to a thickness of from $^{1}/_{16}$ " to $^{3}/_{32}$ ", in accordance with manufacturer's directions. Over IMPERIAL Basecoat, scratch and immediately double back to $^{1}/_{16}$ " thickness.
- e. **DIAMOND Interior Finish:** Over IMPERIAL Gypsum Bases embed tape, fill beads and allow to set; then apply a thin, tight scratch coat over entire working area. Immediately double back with material from same batch to a nom. ¹/₁₆" thickness. Over IMPERIAL Basecoat, scratch and immediately double back to ¹/₁₆" thickness. Over

monolithic concrete, apply a plaster bonding agent; then scratch and double-back to a $^{1}/_{16}"$ thickness.

f. DIAMOND Interior Finish (for electrical cable ceilings): In wood frame and metal grillage constructions, apply DIAMOND Interior Finish over USG R.H. Base according to manufacturer's specifications. Over monolithic concrete ceilings, prepare the surface with plaster bonding agent in a continuous film. Apply job-sanded DIAMOND Interior Finish to a total thickness of 3/6"—consisting of a 5/16" fill coat to completely cover cable and anchoring devices, and 1/16" finish coat.

3.6 ornamental plastering

Execute ornamental plaster in accordance with scale details shown on the drawings. Run cornices and mouldings full, straight and true with moulding plaster, using clean cut metal conforming to the profiles shown on the drawings. Align lines accurately with square intersections, and accurate miters at corners and angles. Prepare enriched ornamental work which cannot be run in place with White HYDROCAL Gypsum cement cast in gelatine molds. Back the work solidly with jute or burlap and properly reinforce with galvanized steel. Make all joints carefully and point neatly so as to be invisible. Sandpaper rough spots and leave the entire work in proper condition, ready for decoration.

3.7 patching

Point up around trim and other work. Cut out and patch defective and damaged plaster. Patch plaster to match existing work in texture and finish flush and smooth.

3.8 completion

At the completion of the finish plaster work, clean all plaster from beads, screeds, metal base and metal trim, leaving work ready for decoration by others. Remove all plaster rubbish, excess material, scaffolding, tools and equipment from the building, leaving floors broom clean.

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, RED TOP, STRUCTO-LITE, STRUCTO-BASE, STRUCTO-GAUGE, BONDCRETE, ORIENTAL, FIRECODE, IMPERIAL, IVORY, GRAND PRIZE, CHAMPION, STAR, ROCKLATH, MORTASEAL, BRACE-TITE, BRIDJOINT, TRUS-LOK, TRUSSTEEL, DIAMOND, SNOWDRIFT, RC-1, DURABOND, HYDROCAL. FOAMULAR is a trademark of UC Industries.

Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

U.S.G. Sales Offices: Arizona: Phoenix, (602)269-5665 • California: Fremont, (415)792-4400; Glendale, (213)956-1882 • Colorado: Denver, (303)744-7008 • Florida: Jacksonville, (904)764-3293; Miami, (305)949-3436 • Georgia: Atlanta, (404)393-0770 • Hawaii: Honolulu, (808)538-7712 • Illinois: Chicago, (312)321-4000 • Indiana: Indianapolis, (317)848-1513 • Kansas: Prairie Village, (913)362-0503 • Kentucky: Louisville, (502)897-2529 • Louislana: New Orleans, (504)241-2020 • Maryland: Baltimore, (301)355-2200 • Massachusetts: Charlestown, (617)241-8530 • Michigan: Grand Rapids, (616)942-8870; Southfield, (313)569-1900 • Minnesota: Minneapolis, (612)835-4626 • Missouri: St. Louis, (314)872-9172 • Nebraska: Omaha, (402)333-5204 • New York: Albany, (518)458-7437; Oakfield (716)948-5081; Stony Point, (914)786-2820; Tarrytown, (914)332-0800 • North Carolina: Charlotte, (704)332-5023 • Ohio: Chesterland, (216)729-1957; Cincinnati, (513)771-3215; Columbus, (614)451-7710 • Pennsylvania: Philadelphia, (215)724-4552; Pittsburgh, (412)341-0364 • Tennessee: Nashville, (615)254-0622 • Texas: Dallas, (214)357-6277 • Utah: Salt Lake City, (801)359-3751 • Virginia: Norfolk, (804)461-1332; Richmond, (804)285-7528 • Washington: Bellevue, (206)455-2595 • Wisconsin: Milwaukee, (414)375-3111 • International Div.: Chicago, III. (312)321-5837.







STATES

UNITED



fire-resistant drywall partitions for enclosing shafts in multi-story buildings

description

USG Cavity Shaft Walls offer high performance characteristics and greater economy than other shaft walls. Engineered design of the C-H stud system provides a thinner, lighter weight assembly that offers faster installation and lower material costs, producing lower in-place costs as well as savings in structural steel. In addition, USG Shaft Walls provide up to 4-hour fire resistance and sound ratings to 51 STC. They resist lateral loads up to 15 psf; also resist fatigue failure under cyclic lateral loading.

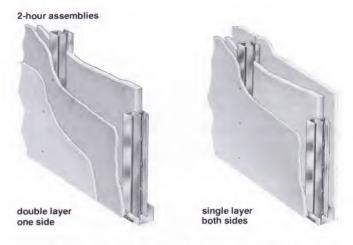
USG Cavity Shaft Walls are non-load bearing gypsum board partition assemblies designed for erection from outside the shaft at each floor. Shafts are enclosed early in construction, the walls finished later along with interior partitions. This fast-installation feature combined with low-cost materials and high performance values, makes USG Shaft Walls superior enclosures for elevator and mechanical shafts, air ducts and stairwells in multi-story buildings.

The C-H Stud shaft wall system uses lower-cost studs and gypsum panels than other shaft walls. Dead load is 10% less for a partition having 2-hour fire resistance and equivalent structural strength. In addition to a 1½" deep x 22½" wide vertical chaseway, the C-H Stud used has 1" dia. holes 16" from each end for horizontal conduit runs. A 3" deep chase to carry electrical elevator controls is available when the 4" C-H stud is used.

The assemblies consist of SHEETROCK BRAND FIRECODE "C" Gypsum Panels or IMPERIAL FIRECODE "C" Gypsum Base and veneer finish, steel studs and runners, and USG Shaft Wall Liner.

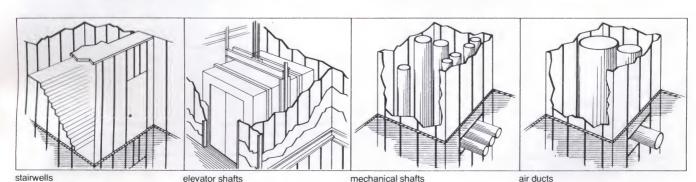
Liner panels are installed vertically between USG Steel J-Runners attached to floor and ceiling. Panel edges are inserted into specially formed USG Steel C-H Studs spaced 24" o.c. The 2-hour shaft wall is completed with double-layer ½" thick gypsum panels and a U.S.G. Joint System, or with gypsum base and veneer finish applied to one side. Where both sides of the wall must be finished, single-layer panels are applied each side of studs. A 1-hour assembly is obtained with single-layer 5%" thick face panels. Additional layers of panels are installed in 3 and 4-hour fire-rated construction (see details, page 3).

Liner panels have a special fire-resistant core and multi-layered green paper facings that are treated to resist moisture penetration. Available in lengths up to 16 ft. (14 ft. max. some markets), the panels are 1" thick, 24" wide and have beveled edges. SHEETROCK BRAND FIRECODE "C" Panels for these systems are ½" or 5%" thick and 4 ft. wide. IMPERIAL FIRECODE "C" Gypsum Base, ½" or 5%" thick and 4 ft. wide, has a high-strength, high-density core covered with special-absorption face paper for a veneer finish. USG Steel J-Runners, C-H Studs and E-Studs are formed from hot-dip galvanized steel.





USG Shaft Walls withstand air-pressure loads which high-speed elevators create. These forces have dislodged masonry units in some building shafts.



UNITED STATES GYPSUM

engineered performance to meet design requirements

The systems have been designed and tested using accepted engineering practices with deflection criteria of 1/120, 1/240, and 1/360 clear partition heights. A wide range of product and installation combinations is available to meet performance requirements: intermittent air pressure loading of 5, 7½, 10, 15 psf; vertical heights up to 15 ft. using 2½" studs with greater heights available for lobbies and mechanical rooms using 4" or 6" studs (see Limiting Height Table, below). Up to 4-hour fire-resistance ratings and excellent sound control (see test data, page 3). Many assembly details for doors and other penetrations of USG Shaft Walls have been tested for compliance with 2-hr. fire ratings.

faster completion—earlier occupancy

USG Shaft Walls erect easily using components and application procedures familiar to mechanics. Cavity Shaft Walls, because they are erected without adhesives, install faster than other multi-layer gypsum panel systems. All USG Shaft Wall Systems install from each floor, leaving shaft free of scaffolding. Elevators go in months earlier than with masonry enclosures—ready to move men and materials to floors when they are needed. Jobs move faster, schedules are more easily met and buildings can be occupied sooner.

economy

USG Shaft Walls utilize low-cost materials and a minimum number of components. The assemblies are lightweight, ranging from the exceptionally low 9 psf for 2-hour systems to 16 psf for the 4-hour assembly. In high-rise buildings, where masonry shaft enclosures can weigh up to 45 psf, USG Shaft Walls offer an opportunity for significant savings in structural steel framing costs.

sound control

The standard Cavity Shaft Wall assembly offers 39 STC rating; 48 STC can be obtained by adding 1" THERMAFIBER Sound Attenuation Blankets within the partition cavity and 51 STC with RC-1 Resilient Channels and 11/2" THERMAFIBER Blankets.

provide airtight seal

With USG Acoustical Sealant applied to partition perimeter and penetrations, the assemblies resist air pressure surges up to 15 psf (see details). This minimizes whistling and dirt accumulation due to air movement in elevator shafts.



Shaft area is rapidly closed in, providing safety for following trades.

limitations

- 1. Non-load bearing.
- 2. Stud and runner thickness, stud spacing, air pressure loading and maximum flexural stress shown in the Design Data tables should not be exceeded.
- 3. Elevator door operating equipment should be independently mounted.
- 4. Exposure to excessive or continuous moisture and extreme temperatures should be avoided.

limiting heights(1)

				intermittent air pressure load (wind load)—psf												
stud type	desig-	stud	allow.	2-hr. fire-rated system—test B, D, E, F			B, D, E, F	2-hr. fire	-rated syst	tem(2)—te	st C	1-hr. fire	1-hr. fire-rated system(3)—test A			
& size	nation	spcg.	defl.	5	7.5	10	15	5	7.5	10	15	5	7.5	10	15	
2½" C-H Studs	212CH25	24"	1/120 1/240 1/360	14'0"(f) 13'9"(d) 12'0"(d)	11'3"(f) 11'3"(f) 10'6"(d)	10'0"(f) 10'0"(f) 9'6"(d)	8'0"(f) 8'0"(f) 8'0"(f)	14'0"(f) 13'6"(d) 11'9"(d)	11'3"(f) 11'3"(f) 10'3"(d)	10'0"(f) 10'0"(f) 9'3"(d)	8'0"(f) 8'0"(f) 8'0"(f)	14'0"(f) 12'0"(d) 10'6"(d)	11'3"(f)* 10'6"(d)* 9'0"(d)*	10'0"(f)* 10'0"(f)* 8'3"(d)*	6′9″(v)* 6′9″(v)* 6′9″(v)*	
I	212CH22	24"	1/120 1/240 1/360	18'0"(f) 15'0"(d) 13'0"(d)	14'9"(f) 13'0"(d) 11'6"(d)	12'9"(f) 11'9"(d) 10'3"(d)	10'6"(f) 10'3"(d) 9'0"(d)	17'3"(d) 13'6"(d) 12'0"(d)	14'9"(f) 12'0"(d) 10'6"(d)	12'9"(f) 10'9"(f) 9'6"(d)	10'6"(f) 9'6"(d) 8'3"(d)	16'6"(d) 13'3"(d) 11'6"(d)	14'6"(d) 11'6"(d) 10'0"(d)	12'9"(f) 10'6"(d) 9'3"(d)	10'6"(f)* 9'3"(d)* 8'0"(d)*	
4" C-H Studs	400CH25	24"	1/120 1/240 1/360	19'3"(f) 16'3"(d) 14'3"(d)	15'6"(f) 14'3"(d) 12'6"(d)	13'9"(f)* 13'0"(d)* 11'3"(d)*	9'6"(v)* 9'6"(v)* 9'6"(v)*	19'3"(f) 16'3"(d) 14'3"(d)	15'6"(f) 14'3"(d) 12'6"(d)	13'9"(f)* 13'0"(d)* 11'3"(d)*	9'6"(v)* 9'6"(v)* 9'6"(v)*	19'0'(d)* 15'0'(d)* 13'3"(d)*	15'6"(f)* 13'3"(d)* 11'6"(d)*	13'6"(v)* 12'0"(d)* 10'6"(d)*	9'0"(v)* 9'0"(v)* 9'0"(v)*	
I	400CH20	24"	1/120 1/240 1/360	22'9"(d) 18'3"(d) 15'9"(d)	20'0"(d) 15'9"(d) 13'9"(d)	18'3"(d)* 14'6"(d)* 12'6"(d)*	13'6"(v)* 12'6"(d)* 11'0"(d)*	23'6"(d) 18'9"(d) 16'3"(d)	20'6"(d) 16'3"(d) 14'3"(d)	18'9"(d)* 14'9"(d)* 13'0"(d)*	13'6"(v)* 13'0"(d)* 11'3"(d)*	22'0"(f) 17'6"(d) 15'3"(d)	18'3"(f)* 15'3"(d)* 13'3"(d)*	15'6"(f)* 14'0"(d)* 12'3"(d)*	11'3"(v)* 11'3"(v)* 10'9"(d)*	
double 6" E-Studs	600ES25	24"	1/120 1/240 1/360	28'0"(v) 26'3"(d) 23'0"(d)	18'9"(v) 18'9"(v) 18'9"(v)	14'0"(v) 14'0"(v) 14'0"(v)	9'3"(v) 9'3"(v) 9'3"(v)	28'0"(v) 25'6"(d) 22'3"(d)	18'9"(v) 18'9"(v) 18'9"(v)	14'0"(v) 14'0"(v) 14'0"(v)	9'3"(v) 9'3"(v) 9'3"(v)	28'0"(v) 25'3"(d) 22'0"(d)	18'9"(v) 18'9"(v) 18'9"(v)	14'0"(v) 14'0"(v) 14'0"(v)	9'3"(v) 9'3"(v) 9'3"(v)	
±	600ES20	24"	1/120 1/240 1/360	28'0"(c) 28'0"(c) 26'3"(d)	28'0"(c)* 26'3"(d)* 23'0"(d)	28'0"(c)* 24'0"(d)* 21'0"(d)*	20'0"(v)* 20'0"(v)* 18'3"(d)*	28'0"(c) 28'0"(c) 26'3"(d)	28'0"(c)* 26'0"(d)* 22'9"(d)	28'0"(c)* 23'6"(d)* 20'6"(d)*	20'0"(v)* 20'.0"(v)* 18'0"(d)*	28'0"(c) 28'0"(c) 25'3"(d)	28'0"(c)* 24'9"(d) 21'9"(d)	28'0"(c)* 22'6"(d)* 19'6"(d)	20'0"(v)* 20'0"(v)* 17'3"(d)*	

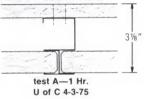
(1) Table heights apply to sustained pressures equal to ¾ of intermittent pressures shown. (2) For assembly with single-layer board both sides of studs. (3) For assembly with single-layer board attached to studs. Limiting criteria: f—bending stress, d—deflection, v—end reaction shear, c—practical limitation. Runner attachment spacing should not exceed 24" o.c. Use 20 ga. runner for heights with asterisk.

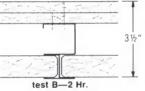
test data/components

	fire-rated construction	acoustic	al performance	
fire rating	description & test no.	STC	description & test no.	
1 hr.	Cavity Shaft Wall—%" SHEETROCK Brand FIRECODE "C" gypsum panels one side—1" USG shaft wall liner panels set betw USG steel C-H studs 24" o.c.—panels appl vert to side opp liner panels & screw att—joints fin—U of C 4-3-75† wt 8 width 3\%"	N/A		Α
2 hr.	Cavity Shaft Wall—2 layers ½" SHEETROCK Brand FIRECODE "C" gypsum panels one side—1" USG shaft wall liner panels set betw USG steel C-H studs 24" o.c.—panels appl vert to side opp liner panels & screw att—joints fin— U of C 4-2-75 † wt 9 width 3½"	39 47	USG-750302 Based on 1" sound atten. blankets in cavity—BBN-750706	В
2 hr.	Cavity Shaft Wall—1/2" SHEETROCK Brand FIRECODE "C" gypsum panels—1" USG shaft wall liner panels set betw USG steel C-H studs 24" o.c.—single layer panels ea side appl vert & screw att—joints stag on opp sides & fin— U of C 6-23-75† wt 9 width 31/2"	N/A		С
2 hr. est	Cavity Shaft Wall—2 layers 1/2" SHEETROCK Brand FIRECODE "C" gypsum panels one side—1" USG shaft wall liner panels set betw USG steel C-H studs 24" o.c.—RC-1 chan spaced 24" o.c.—11/2" THERMAFIBER sound atten blkts—panels & RC-1 chan screw att to side opp liner panels—base layer appl horiz—face layer appl vert—joints fin—est. fire rating based on U of C 2-8-72 and U of C 6-23-75† wt 10 width 4"	51	BBN-750412	D
3 hr. est	Cavity Shaft Wall—3 layers 56" SHEETROCK Brand FIRECODE "C" gypsum one side—1" USG shaft wall liner panels set betw USG steel C-H studs 24" o.c.—panels screw att to side opp liner panels with joints stag—base & face layers appl vert—mid layer appl horiz—joints fin—est. fire rating based on U of C 2-16-72† wt 12 width 436"	N/A		Е
4 hr. est	Cavity Shaft Wall—2 layers %" SHEEETROCK Brand FIRECODE "C" gypsum panels face side—1" USG shaft wall liner panels set betw USG steel C-H studs 24" o.c.—1" liner panels & %" gypsum panel core screw att to studs—horiz USG met fur chan 24" o.c.—face side panels screw att to fur chan—panels appl vert with joints stag—joints fin—est. fire rating based on U of C 5-24-74† wt 16 width 61/4"	N/A		F

†Fire rating also applies with IMPERIAL FIRECODE "C" Base and veneer finish surface.

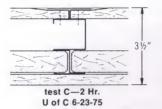
rated assemblies

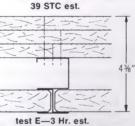




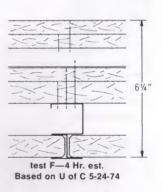
U of C 4-2-75 39 STC-USG-750302 3 1/2

test B-2 Hr. est. Based on U of C tests 47 STC-BBN-750706





Based on U of C 2-16-72



design properties-steel components

test D-2 Hr. est.

51 STC-BBN-750412

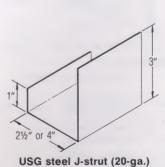
stud &	stud designation	avg. weight (ib/lin ft)	I _X (in ⁴)	S _X * (in³)	design stress (ksi)	end reaction (lb)
21/2" C-H	212CH25	.604	.146	.135	16.30	205
stud	212CH22	.862		.185	19.96	422
4"C-H	400CH25	.716	.433	.258	16.30	173
stud	400CH20	1.243	.730	.431	21.20	282
double	600ES25	1.546	2.004	.628	20.00	140
6" E-Stud	600ES20	2.372	3.400	1.094	20.00	300

*Full section modulus to be used with corresponding design stress. For wind loads, design stress shown can be increased 33%. Section properties for steel J-runners available on request; contact U.S.G.

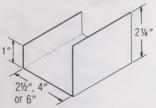
thickness—steel components(1)

	design(2)		minimum		
style	in	mm	in	mm	gauge(3)
CH. ES 25	0.0209	0.53	0.0199	0.51	25
JR 24	0.0239	0.61	0.0227	0.58	24
CH 22	0.0310	0.79	0.0294	0.75	22
ES. JR. JS 20	0.0359	0.91	0.0341	0.87	20
CH 20	0.0359	0.91	0.0344	0.87	20

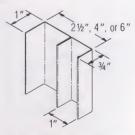
(1) Uncoated steel thickness; meets ASTM A568. Studs meet ASTM C645. Base metal meets ASTM A446 standards for structural performance. Min. yield strength 33 ksi, except C-H stud 40 ksi. Coatings are hot-dip galvanized per ASTM A525; aluminized per ASTM A526; aluminized per ASTM A63, or 55% aluminum-zinc. (2) Conforms to AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition. (3) For information only; refer to limiting height tables and structural properties for design data.





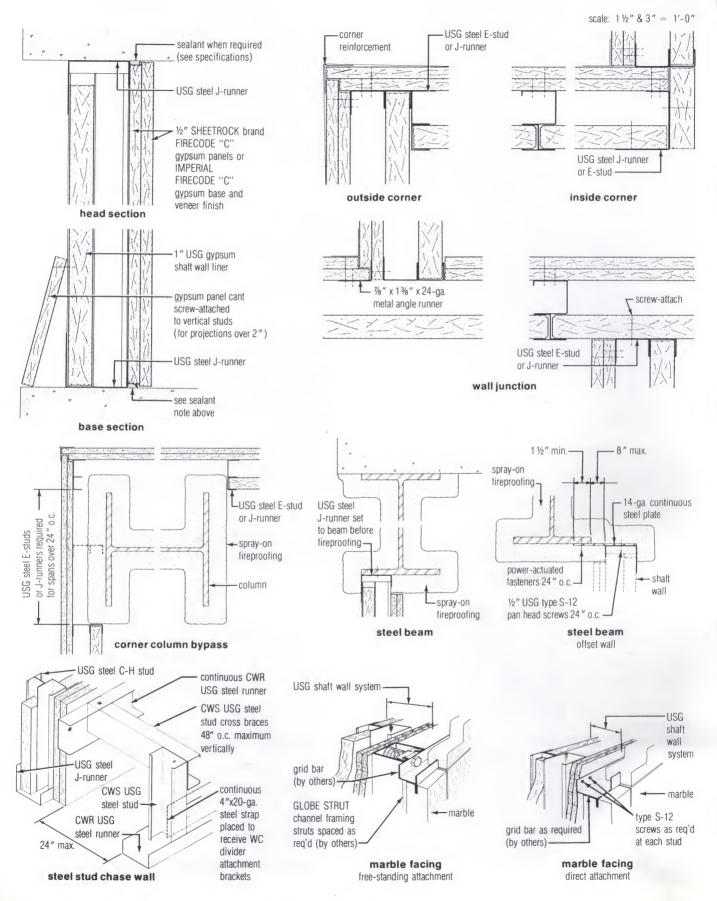


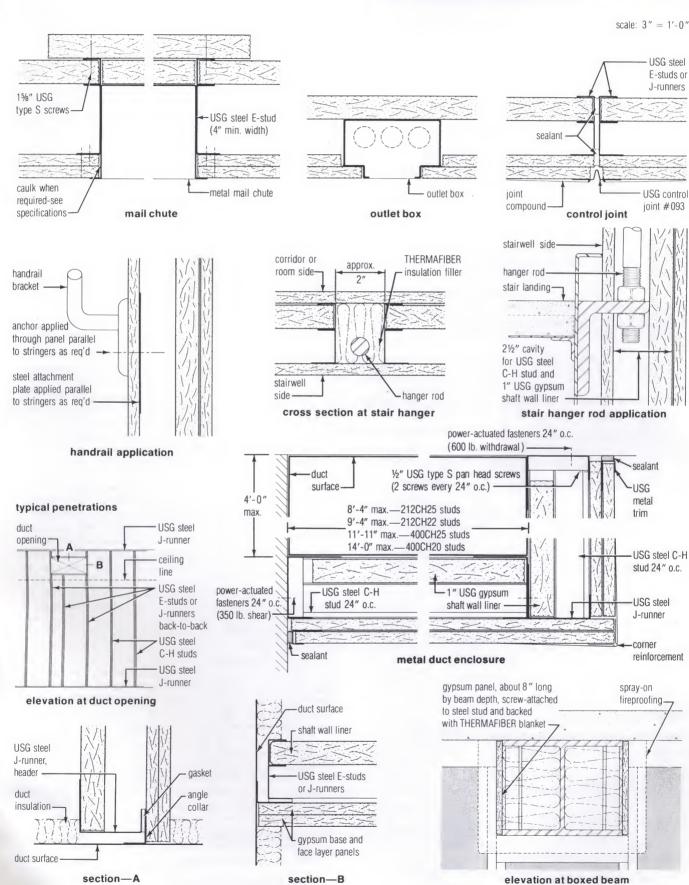




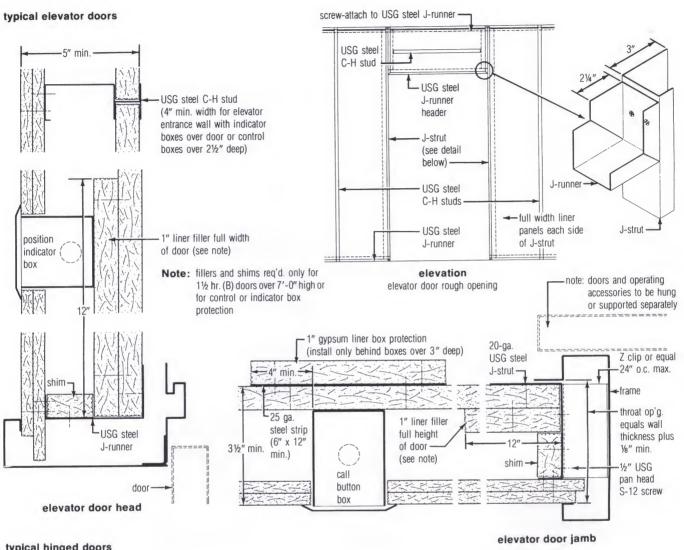
USG Steel E-Stud (ES)

details

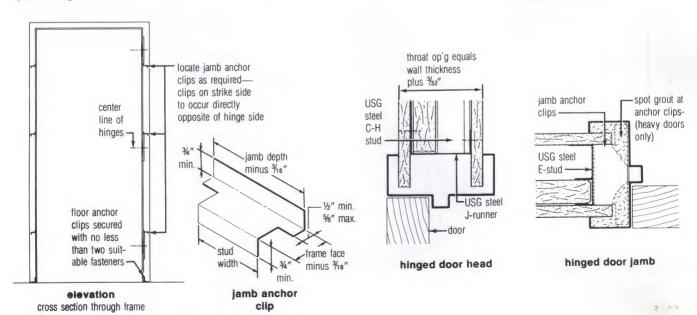




details



typical hinged doors



specifications

notes to architect

- 1. System Performance—U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.
- 2. Control Joints—Shaft wall surfaces should be isolated with control joints or other means where: (a) construction changes within the plane of the shaft wall; (b) shaft wall run exceeds 30'. Ceiling-height door frames may be used as control joints, as may less-than-ceiling-height door frames if control joints extend to ceiling from both corners.
- 3. Penetrations of the diaphragm, such as door frames and duct openings, require additional reinforcement at corners to distribute concentrated stresses if a control joint is not used. Penetrations greater than 48" wide require supplemental support for the shaft wall at the opening. Where access panels or large duct penetrations occur in shafts having pressure loads, headers, sills and adjacent channels may require reinforcing to properly distribute these loads.
- 4. Pressure Loads—Where shaft walls enclose elevator and return air vents, and intermittent pressures up to 15 psf are expected, sealant is recommended at intersections with floors, ceilings, columns, ducts, etc. to seal peripheries and penetrations and minimize whistling and dirt accumulation due to air movement. Construction is not recommended as a duct without metal lining for sustained air pressures exceeding 5 psf. Special details to seal the wall under sustained pressures must be provided by the designer.
- **5. Screws**–USG Type S Screws are suitable for gypsum panel or gypsum base attachment to 25, 22 and 20-ga. steel studs. Type S-12 Screws should be specified for other applications to steel heavier than 20-ga. Screw length should be 1" for base layer and 1%" for face layer and at least %" longer than the total thickness for other applications.
- **6. Steel Frame Construction**—Runners and studs attached to beams and columns should be installed before steel is spray-fireproofed. Excess fireproofing should be removed from runners and studs before installing shaft wall liner and sealant.
- 7. **Deflection**—Select limiting heights based on allowable deflection as follows: (a) 1/240 for gypsum panel surfaces, veneer finish surfaces, and areas to receive adhesively applied ceramic tile: (b) mechanically attached marble or heavy stone should support its own weight from the floor or be separately supported. Some building codes permit 1/120 deflection and 5 psf uniform load, but this large deflection causes failure of screws attaching gypsum panels to steel components.
- 8. Steel door frames should be at least 16-ga. steel, shop primed, and have throats accurately formed to overall thickness of the shaft wall plus $\frac{3}{32}$ " minimum. They should be anchored at floor with 16-ga. steel plates welded to trim flanges, with provision for two power-driven anchors or equal per plate. Jamb anchor clips should be 18-ga. steel welded in jamb (see details, page 6), and screw-attached to struts.

All one-piece frames should be grouted after shaft wall liner is installed. Apply DURABOND Joint Compound just before inserting face layer into frame. Do not terminate panels against trim return. Provide additional bracing where required by installing diagonal bracing from jamb strut-studs to structure.

- 9. Hoistway Entrances—Certain firms have conducted fire tests with their door and frame assemblies in USG Cavity Shaft Walls. Specific door jamb studs or runners and installation methods may be required for fire-rated construction. See entrance manufacturer for details.
- 10. Height-Where cavity shaft wall height exceeds max. available panel height, liner panel end joints should be positioned within the upper and lower third-points of wall, joints reinforced with horizontal C-H stud and adjacent vertical studs screw-attached to runners. Also, joints in adjacent panels should be staggered top and bottom to prevent a continuous horizontal joint.
- 11. Electric Boxes—Cavity shaft walls will accommodate outlet boxes with depths up to the stud width.

USG Cavity Shaft Wall Systems SA-922

12. Additional Information—See U.S.G. technical folders in this series and in Sweet's General Building File: Construction Selector SA-100 for fire and sound-rated systems; Gypsum Panels Folder SA-927 for shaft wall components and joint system specifications; Plasters, Bases & Accessories Folder SA-917 for lath and plaster specifications; Texture & Paint Products Folder SA-933 for finishing product specifications.

Part 1: general

1.1 scope—Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

- a. In cold weather during gypsum panel joint finishing, temperatures within the building shall be maintained within the range of 55° to 70°F (13° to 21°C). Adequate ventilation shall be provided to carry off excess moisture.
- b. When low humidity, high temperatures and rapid drying conditions exist during gypsum base and veener finish application, DURABOND Joint Compound and PERF-A-TAPE Reinforcement shall be used on all joints and internal corners and allowed to set and dry thoroughly before plaster application.

1.5 protection

All materials shall be suitably protected from the weather during installation to prevent damage to the shaft wall.

Part 2: products

2.1 materials

- a. Liner Board—1" USG Gypsum Shaft Wall Liner, beveled edge, 24" wide, lengths as required.
- b. Faceboards—(1/2") (%") thick, 48" wide, SHEETROCK Brand FIRECODE "С" Gypsum Panels, lengths as required.
- c. Gypsum Base—(½") (5%") thick, 48" wide, square-edge IMPERIAL FIRECODE "C" Gypsum Base, lengths as required.
- d. Joint Treatment—(select a U.S.G. Joint System).
- e. IMPERIAL Tape—(Type P) (Type S) for gypsum base.
- f. Fasteners—USG Screws: $(\frac{3}{2})'(\frac{1}{2})'$ Type (S) (S-12) pan head; (1") (15%") (2\(\frac{1}{2})'\) Type S bugle head.
- g. USG Metal Trim-No. (200A) (200B) (401) (402) (701B) (801B).
- h. USG Corner Bead—(Dur-A-BEAD) (No. 800) (No. 900).
- i. USG Control Joint No. 093.
- j. USG Metal Furring Channels.
- k. RC-1 Resilient Channels.
- I. USG Steel C-H Studs, (212CH25) (212CH22) (400CH25) (400CH20) hot-dipped galvanized, lengths as required (select from tables).
- m. USG Steel E-Studs, (212ES25) (212ES20) (400ES25) (400ES25) (600ES25) (600ES20) hot-dipped galvanized, lengths as required (select from tables).
- n. USG Steel J-Runners, (212JR24) 400JR24) (600JR24) (212JR20) (400JR20) (600JR20) hot-dipped galvanized, for USG Steel CH and E-Studs.
- **o.** USG Steel J-Struts, (212JS20) (400JS20) hot-dipped galvanized (for elevator door framing).
- **p.** Runner Fasteners, power-driven type, to withstand 193 lb. single shear and 200 lb. bearing force when driven through structural head or base and without exceeding allowable design stress in runner, fastener or structural support (not available from U.S.G.).
- q. USG Acoustical Sealant.

3.1 cavity shaft wall erection

Position steel runners at floor and ceiling with the short leg toward finish side of wall. Securely attach runners to structural supports with power driven fasteners at both ends and (16") (24") o.c. With steel frame construction, install floor and ceiling runners and J-Runners or E-Studs on columns before steel is fireproofed. Remove spray-fireproofing from runners and E-Studs before installing shaft wall liner.

Cut liner board panels 1" less than floor-to-ceiling height and erect vertically between J-Runners. Where shaft walls exceed max. available panel height, position liner panel end joints within upper and lower third points of wall. Stagger joints top and bottom in adjacent panels and reinforce joints with horizontal C-H stud.

Use steel C-H studs 3/8" to not more than 1/2" less than floor-to ceiling height, and install between liner panels with liner inserted in the groove. Install full-length steel E-Studs or J-Runners vertically at T-intersections, corners, door jambs, and columns. Install full-length E-Studs over shaft wall liner both sides of closure panels. Frame openings cut within a liner panel with J-Runner around perimeter. For openings, frame with vertical E-Stud or J-Runner at edges, horizontal J-Runner at head and sill, and reinforcing as shown on the drawings. Suitably frame all openings to maintain structural support for wall.

Install floor-to-ceiling steel E-Studs each side of steel hinged door frames and J-Struts each side of elevator door frames to act as strut-studs. Attach strut-stud to floor and ceiling runners with two 3/8" Type S-12 Pan Head Screws. Over steel doors, install a cut-to-length section of J-Runner and attach to strut-studs with 3/8" Type S-12

Install RC-1 Resilient Channels horizontally to face of studs, within 6" of floor and ceiling and max. 24" o.c. Attach channels to studs with 3/8" Type S-12 Screws driven through holes in mounting flange. Extend channels into all corners and attach to corner framing. Splice channel by nesting directly over stud; screw-attach through both flanges. Reinforce with screws at both ends of splice. Install 1/2" x 3" wide continuous gypsum filler strips to top and bottom runner.

For resiliently attached finish, apply base layer horizontally to resilient channels with end joints staggered; fasten with 1" Type S screws 12" o.c. Apply face layer vertically with joints staggered and attach to channels with 15/8" Type S Screws 12" o.c.

For single layer finish, erect 5/8" SHEETROCK Brand FIRECODE "C" Panels on corridor side. Fasten to studs and runners with 1" Type S

For double-layer finish, erect 1/2" SHEETROCK Brand FIRECODE "C" Gypsum Panel or IMPERIAL FIRECODE "C" Gypsum Base vertically one side of studs. Fasten base layer to studs 1" Type S Screws 24" o.c. Caulk perimeter of base layer.

Apply 1/2" SHEETROCK Brand FIRECODE "C" Gypsum Panel or IMPERIAL FIRECODE "C" Gypsum Base face layer vertically over base layer with joints staggered and attached with 15/8" Type S Screws staggered from those in base, spaced 12" o.c. and driven into studs and runners

Where both sides of shaft wall are finished, apply 1/2" SHEETROCK Brand FIRECODE "C" Panel or IMPERIAL FIRECODE "C" Gypsum Base face layers vertically both sides of studs. Stagger joints on opposite partition sides. Fasten panels or base with 1" Type S Screws spaced 12" o.c. in field and along edges.

For triple-layer finish, erect base layer vertically one side of studs, mid layer horizontally with joints staggered and face layer vertically with joints staggered. Attach gypsum panels or base to studs with 1" Type S Screws 24" o.c. for base layer, 15%" Type S Screws 24" o.c. for mid layer and 21/4" Type S Screws 16" o.c. for face layer. Attach face layer to J-Runners with 21/4" Type S Screws 12" o.c.

Note-for 4-hr. assembly, erect steel runners, steel studs and liner

panels as described in first four paragraphs, then continue construc-

Position second layer liner panels vertically over studs and fasten to studs and runners with 15%" Type S Screws spaced 6" from top and bottom and 24" o.c. Apply 5%" SHEETROCK Brand FIRECODE "C" Gypsum Panel or IMPERIAL FIRECODE "C" Gypsum Base layer vertically over liner panels and attach with 21/4" Type S Screws staggered from screws in liner panel layer, spaced 24" o.c. and driven into studs.

Install USG Metal Furring Channels horizontally over gypsum panel or base at ceiling and spaced 24" o.c. vertically. Fasten top channel to studs and runner with 21/4" Type S Screws spaced 12" o.c. and alternated on channel flanges. Fasten other channels to studs with screws spaced 24" o.c. in top channel flange.

Install second layer 5/8" SHEETROCK Brand FIRECODE "C" Gypsum Panels or IMPERIAL FIRECODE "C" Gypsum Base vertically over furring channels with vertical joints staggered 24" from joints in first layer. Fasten panels or base to channels with 1" Type S Screws spaced 1" from vertical edges, 12" o.c. in top channel and 24" o.c. in other channels. Install face layer panels or base vertically over second layer with vertical joints staggered 24" and fasten to furring channels with 15%" Type S Screws located 3/4" and 6" from edges and spaceds 12" o.c. in between.

3.2 accessory application

- a. Gypsum Panel Joints-Finish all face layer joints and internal angles with a U.S.G. Joint System installed according to manufacturer's directions. Spot exposed fasteners on face layers and finish corner bead, control joints and trim as required, with at least three coats of joint compound, feathered out onto panel faces and sanded
- b. Gypsum Base Joints—Apply IMPERIAL Tape over full length of all gypsum base joints; do not overlap at intersections. Firmly press Type P Tape along entire length with steel trowel to insure firm wrinkle-free attachment. Fasten Type S Tape with 3/8" staples; use two staples at each tape end and stagger intermediate staples 24" along length; at internal corners, staple tape 24" o.c. to ceiling or one side only. When rapid drying conditions exist, use DURABOND Joint System installed according to manufacturer's directions.
- c. Comer Bead-Reinforce all vertical and horizontal exterior corners with corner bead fastened with screws or staples 9" o.c. on both flanges along entire length of bead.
- d. Metal Trim-Where shaft wall terminates against masonry or other dissimilar material, apply metal trim over face layer edge and fasten with screws or staples spaced 9" o.c.
- e. Screws—Power-drive at least 3/8" from edges or ends of gypsum panels to provide uniform dimple 1/32" deep. In gypsum base, set flush with surface without tearing face paper.
- f. Control Joints-Break face layer behind joint. Attach control joint to face layer with staples spaced 6" o.c. on both flanges along entire length of joint.

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, SHEETROCK, FIRECODE, PERF-A-TAPE, DURABOND, DUR-A-BEAD, THERMAFIBER, IMPERIAL, RC-1, GLOBE STRUT.

Note: All products described here may not be available in all geographic markets. Consult your local U.S.G sales office or representative for information

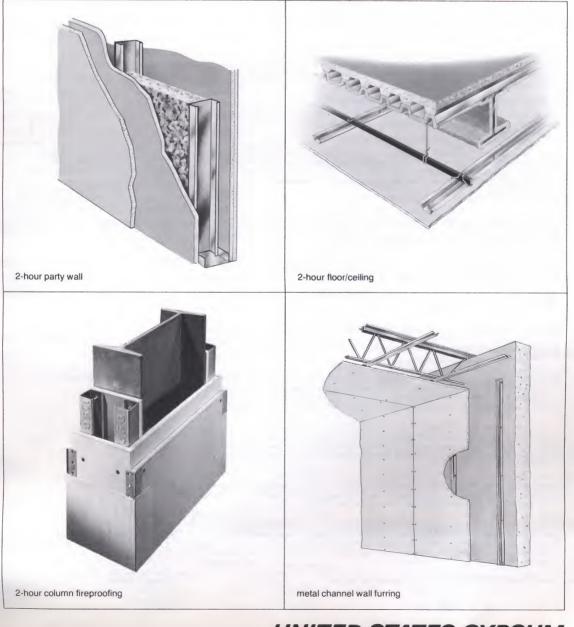
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SA-922/USG/rev. 1-83

General Offices: 101 South Wacker Drive, Chicago, Illinois 60606

Printed in U.S.A.

lightweight, fire and sound-resistant assemblies for interior partitions, ceilings, column fireproofing, wall furring



UNITED STATES GYPSUM

partitions/test data

fire	fire-rated construction	acoustic	cal performance	
rating	description & test no.	STC	description & test no.	
1 hr.	Steel Stud—½" SHEETROCK brand FIRECODE "C" gypsum panels—2½" USG studs 24" o.c.—single layer panels ea side appl vert & screw att—1½" THERMAFIBER sound atten blkts one side—joints fin—perimeter caulked— T-3362-OSU wt 5 width 3½"	45 48	TL-69-42 Based on 3%" studs & 2" blankets— SA-800422	
1 hr. est	Steel Stud—%" SHEETROCK brand FIRECODE gypsum panels—2½" USG studs 24" o.c.—1½" THERMAFIBER sound atten blkts—2 layer—base layer ¼" SHEETROCK brand panels screw att—%" face layer screw att—joints fin—perimeter caulked—est. fire rating based on T-1174-OSU wt 7 width 4¼"	55 53	CK-684-14 Based on ½" thick panels—CK-684-13	
1 hr. est	Steel Stud—½" SHEETROCK brand FIRECODE "C" gypsum panels—2½" USG studs 24" o.c. —single layer panels one side appl vert & screw att—1½" THERMAFIBER sound atten blkts one side—2 layers opp side—panels appl vert & screw att—joints stag & fin—perimeter caulked —est. fire rating based on T-3362-OSU wt 7 width 4"	50 41	SA-800504 Based on same construction without blankets—TL-69-148	(
1 hr. est	Steel Stud—5%" SHEETROCK brand FIRECODE "C" gypsum panels—35%" USG studs 24" o.c. —single layer panels one side appl vert & screw att—2" THERMAFIBER sound attn blkts one side—2 layers opp side—panels appl vert & screw att—joints stag & fin—perimeter caulked—est. fire rating based on T-3362-OSU wt 8 width 5½"	50	SA-800417	-
1 hr.	Steel Stud—2 layers ½" SHEETROCK brand gypsum panels ea side—1%" USG studs 24" o.c. —panels appl vert & screw att—joints stag & fin—perimeter caulked— U of C 9-21-64 wt 9 width 3%"	53	Based on SHEETROCK brand FIRECODE "C" panels, 2½" studs & 1½" sound atten. blankets—CK-654-40	E
1 hr.	Steel Stud—%" SHEETROCK brand FIRECODE gypsum panels—3%" USG studs 24" o.c. —single layer panels vert or horiz appl & screw att—joints stag & fin—perimeter caulked— T-1174-OSU—based on panels horiz appl—GA-WP-1200 wt 6 width 47%"	42† 48	USG-17FT-G&H Based on 3" sound atten. blankets in cavity and FIRECODE "C" Panels— SA-800415	-
1 hr.	Steel Stud—%" SHEETROCK brand FIRECODE gypsum panels—1%" USG studs 24" o.c. —single layer panels vert appl & screw att 12" o.c.—joints fin—perimeter caulked —U of C 7-31-62 wt 5 width 2%"	38†	TL-64-29	C
1 hr.	Steel Stud Chase Wall—%" SHEETROCK brand FIRECODE gypsum panels ea side—1%" USG studs 24" o.c. in 2 rows spaced 61/4" apart—%" gypsum panel gussets or stl run braces spanning chase screw-att to studs—panels appl vert & screw att—joints stag & fin— —UL Des U420 wt 6 width 103/4"	N/A		ŀ
2 hr.	Steel Stud—2 layers ½" SHEETROCK brand FIRECODE "C:" gypsum panels ea side—2½" or 3%" USG studs 24" o.c.—1", 1½" or 2" THERMAFIBER sound atten blkts stapled—panels appl vert & joints stag—base layer screw att—face layer strip lamin or screw att—joints fin—perimeter caulked—rating based on assembly with or without sound atten blankets—UL Des U412 wt 10 width 4½"	55 54† 53	Based on 3%" studs and 1½" blankets—SA-800421 Based on lamin. face layer— USG-114-FT-G&H Based on 2½" studs, screw-att. face layer and 1½" blankets—CK-654-40	
2 hr.	Steel Stud—2 layers %" SHEETROCK brand FIRECODE gypsum panels plain or vinyl faced vert appl ea side—2½" or 3%" USG studs 24" o.c.—base layer screw att—face layer lamin or screw att—joints fin or unfin—perimeter caulked— UL Des U411 wt 12 width 6%"	48	Based on 3%" studs and %" SHEETROCK brand FIRECODE "C" panels— BBN-77040 8	
2 hr.	Steel Stud—2 layers %" SHEETROCK brand FIRECODE gypsum panels ea side—2½" USG studs 24" o.c.—panels appl horiz & joints stag—base and face layers screw att—joints fin—WHI 0236-0237 wt 12 width 5"	N/A		k
2 hr.	Steel Stud—2 layers ½" SHEETROCK brand FIRECODE "C" gypsum panels—1%" USG studs 24" o.c.—2 layers ea side vert appl & screw att—joints fin— U of C 6-15-65 wt 9 width 3%"	N/A		L
2 hr.	Steel Stud Chase Wall—2 layers %" SHEETROCKhbrand FIRECODE gypsum panels ea side— 156" USG studs 24" o.c. in 2 rows spaced 6'/4" apart—56" gypsum panel gussets or stl run braces spanning chase screw-att to studs—panels appl vert & screw att—joints stag & fin— UL Des U420 wt 13 width 12"	N/A		M
2 hr. est	Steel Stud Chase Wall—2 layers ½" SHEETROCK brand FIRECODE "C" gypsum panels ea side—15%" USG studs 24" o.c. in 2 rows spaced 55%" apart—½" gypsum panel gussets spanning chase att to studs at qtr points—panels appl vert & screw att—1½" THERMAFIBER sound atten blkts one side—joints stag & fin—perimeter caulked—est. fire rating based on UL Des U412 wt 11 width 11"	55†	USG-134-FT-G&H	N
3 hr.	Steel Stud—3 layers ½" SHEETROCK brand FIRECODE "C" gypsum panels ea side—15%" USG studs 24" o.c.—base layers appl vert—face layer appl horiz—panels screw-att with joints stag & fin—perimeter caulked—rating based on assembly with or without sound atten blankets —UL Des U435 wt 15 width 45%"	N/A		0
3 hr.	Steel Stud—3 layers %" SHEETROCK brand FIRECODE "C" ea side—fireproofed steel truss —2½" USG studs 24" o.c. in 2 rows spaced 8" apart—%" gypsum panel gussets spanning chase att to stud at qtr points—panels appl vert & screw-att—joints stag & fin—UL Des U805 wt 15 width 16"	N/A		P
4 hr.	Steel Stud—4 layers ½" SHEETROCK brand FIRECODE "C" gypsum panels ea side—15%" USG studs 24" o.c.—base layers appl vert—face layer appl horiz—panels screw att with joints stag & fin—perimeter caulked—rating based on assembly with or without sound atten blankets —UL Des U435 wt 17 width 55%"	58	Based on assembly with 11/2" sound atten blankets in cavity—SA-820518	Q

partitions

description

These lightweight, fire and sound-resistant assemblies consist of one or two layers of Sheetrack Brand Gypsum Panels screw-attached to steel framing. A specially designed self-tapping steel screw with a rust inhibitive coating is used to attach the panels to the framing. The systems are completed with a U.S.G. joint system and decorating—both steps unnecessary in walls when predecorated vinyl-surfaced Textone Gypsum Panels are used.

Gypsum panels for these assemblies are available in three thicknesses and seven types (see Specifications). Systems using SHEETROCK Brand FIRECODE and FIRECODE "C" Gypsum Panels, with a specially formulated core, obtain higher fire ratings than regular gypsum panels (see table page 2). These versatile panels are applied to USG Steel Studs or Metal Furring Channels to meet design requirements for fixed interior partitions—divider, corridor, party and chase walls; furred and suspended ceilings; wall furring and column fireproofing, as outlined below:

1. Partitions-Single-layer 5/8" SHEETROCK Brand FIRECODE "C" Panels applied to USG Steel Studs, set in runners, provide economical 1-hour fire-rated partitioning for corridors or within units. A 1-hour rating is also available with 1/2" thick panels and 11/2" THERMAFIBER Sound Attenuation Blankets installed in the stud cavity. The studs are available in several widths and types (see Specifications, page 16) and cut to lengths required for the job. Double-layer 1/2" SHEETROCK Brand FIRECODE "C" Panels attached to 21/2" or 35/8" studs spaced 24" o.c. provide a 2-hour fire rating plus sound control suitable for party walls. Multi-layer 1/2" SHEETROCK Brand FIRECODE "C" Panel assemblies offer 3 and 4-hour fire ratings and 58 STC sound control, yet are much lighter weight and thinner than concrete block. These assemblies also provide a 3-hour fire-resistant enclosure for steel trusses in staggered truss systems. Where added partition width is required, double rows of studs are erected to provide chase walls with up to 203/4" net pipe chase width (see page 7).

Shaft Walls—Gypsum panels, assembled with gypsum shaft wall liner and specially shaped C-H Studs, offer systems ideally suited for enclosing elevator shafts, stairwells and other vertical shafts in core areas of multi-story buildings (see separate Shaft Wall Folder SA-922 for applications).

2. Ceilings—Single-layer %" SHEETROCK Brand FIRECODE "C" Panels screw-attached to furred or suspended USG Metal Furring Channels 24" o.c. provide a 3-hour fire rating including beam protec-

tion (see page 13). The systems are also suitable for separate beam protection and for exterior ceilings and soffits with USG Exterior Gypsum Ceiling Board facings.

- 3. Wall Furring—With Foil-Back Gypsum Panels screwed to USG Metal Furring Channels, this construction provides an excellent vapor retarder as exterior wall furring (see page 10). Panel application to USG Z-Furring Channels with semi-rigid insulation provides a fully insulated wall at a cost competitive with many non-insulated furred walls.
- **4. Column Fireproofing**—SHEETROCK Brand FIRECODE "C" Panels screw-attached to steel studs at column corners and finished with corner bead and joint compound, offer lightweight, compact fire protection for steel columns (see page 9).

function and utility

Adaptable to virtually every type of new construction—commercial, institutional, industrial and residential—or in modernization to provide smooth, durable interior surfaces.

Fire Resistant—Constructed of noncombustible components. Established fire ratings available to meet design requirements; partitions up to 4 hours, ceilings up to 3 hours including beam, column fireproofing up to 4 hours.

Sound Isolation—STC ratings up to 58 for multi-layer, 55 for double-layer and 48 for single-layer partitions; 54 for single-layer ceilings. THERMAFIBER Sound Attenuation Blankets improve sound control.

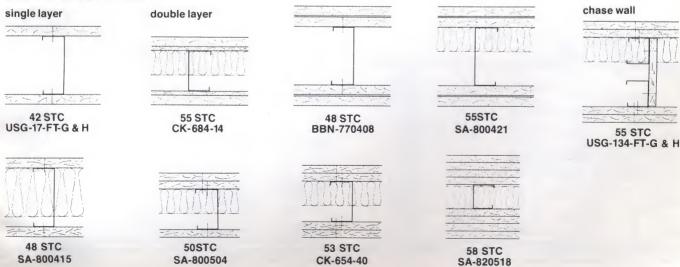
Lightweight—These thin drywall assemblies weigh only 5 to 17 psf, reduce dead load and save floor area.

Economical—Low material cost and speed of erection provide realistic and competitive construction costs.

limitations

- 1. Non-load bearing.
- 2. Exposure to excessive or continuous moisture and extreme temperatures should be avoided.
- 3. Maximum frame spacing is 24" o.c., except when single-layer ceiling panels are applied with long edges parallel to joists and used as a base for spray-applied texture finish, max. frame spacing is 16" o.c.
- 4. In ceiling design, certain precautions concerning construction, isolation and ventilation are necessary for good performance (see Specifications, page 16).

sound-tested assemblies



technical data

structural properties—steel studs

	stud designation(1)	l _X —in ⁴	S _X —in³	r _x —in	iy —in4	Sy —in³	ry —In
	158ST	0.038	0.044	0.678	0.019	0.023	0.484
	212ST	0.103	0.076	1.012	0.020	0.023	0.480
	358ST	0.243	0.125	1.415	0.021	0.024	0.464
	400ST	0.307	0.143	1.544	0.021	0.024	0.458
	600ST	0.810	0.255	2.208	0.021	0.024	0.426
Y	158STL	0.032	0.036	0.678	0.013	0.019	0.480
-	212STL	0.083	0.060	1.012	0.013	0.019	0.476
xx	358STL	0.206	0.105	1.414	0.018	0.021	0.460
~	212CWS	0.186	0.147	1.005	0.040	0.045	0.472
4	358CWS	0.441	0.241	1.406	0.045	0.046	0.457
¥	400CWS	0.556	0.275	1.536	0.046	0.046	0.451
	600CWS	1.472	0.487	2.198	0.047	0.047	0.419
	35SJ22	0.405	0.222	1.376	0.070	0.068	0.626
	35SJ20	0.488	0.277	1.373	0.083	0.081	0.623
	362SJ20	0.541	0.293	1.429	0.085	0.082	0.621
	40SJ20	0.673	0.333	1.556	0.091	0.083	0.617
	35CS18	0.482	0.277	1.326	0.040	0.041	0.413

(1) Indicates size, style and gauge: (SJ and CS members only): 158—156"; ST and CWS—stud, SJ—stud-joist; 22—ga. thickness (see table below). Yield strength: ST and CWS, 33 ksi; SJ and CS, 40 ksi.

structural properties—steel runners

	runner designation	i _X —in ⁴	S _X —in³	r _X —in	f _X —ksi (1)
	158CR	0.029	0.037	0.663	6.11
	212CR	0.082	0.065	0.992	6.11
	358CR	0.195	0.107	1.366	6.11
	400CR	0.247	0.123	1.488	6.11
	600CR	0.668	0.222	2.115	6.11
	158CRL	0.028	0.034	0.683	4.45
	212CRL	0.074	0.059	0.993	4.45
_	358CRL	0.174	0.096	1.366	4.45
	400CRL	0.221	0.110	1.488	4.45
(X	600CRL	0.597	0.198	2.116	4.45
	212CWR	0.155	0.120	1.006	12.45
	358CWR	0.365	0.197	1.379	12.45
	400CWR	0.461	0.226	1.500	12.45
	600CWR	1.238	0.407	2.126	12.45
	35CR22	0.289	0.162	1.333	11.30
	35CR20	0.348	0.194	1.334	12.77
	35CR18	0.463	0.257	1.335	16.00
	362CR20	0.378	0.204	1.374	12.77
	40CR20	0.477	0.234	1.495	12.77

(1) Reduced stress based on Sec.3.2, AISI Specification for the Design of Cold-Formed Steel Structural Members. Yield strength: 33 ksi.

thickness-steel studs(1)

stud	design(2)		minimum		
style	in	mm	in	mm	gauge(3)
STL	0.0168	0.43	0.0160	0.41	26
ST	0.0188	0.48	0.0179	0.45	25
SJ 22	0.0299	0.76	0.0284	0.72	22
CWS	0.0344	0.87	0.0329	0.84	20
SJ 20	0.0359	0.91	0.0341	0.87	20
CS 18	0.0478	1.21	0.0454	1.15	18

(1) Uncoated steel thickness; meets ASTM A568. Coatings are hot-dip galvanized per ASTM A525; aluminized per ASTM A463, or 55% aluminum-zinc. (2)Conforms to AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition. (3)For information only; refer to limiting height and structural properties table for design data.

limiting height—chase wall partition

stud desig.	stud width	stud spacing	allow. defi.	one layer	two layers
158ST	15/8"	16"	1/120 1/240	15′3″ f 13′3″ d	15′3″ f 14′6″ d
		24"	1/120 1/240	12'6" f 11'6" d	12'6" f 12'6" f
212ST	21/2"	16"	1/120 1/240	19'6" f 17'6" d	19'6" f 19'0" d
		24"	1/120 1/240	16'0" f 15'6" d	16'0" f 16'0" f
358ST	35/8"	16"	1/120 1/240	23'6" f 22'9" d	23'6" f 23'6" f
		24"	1/120 1/240	19'3" f 19'3" f	19'3" f 19'3" f
212CWS	21/2"	16"	1/120 1/240	24'3" d 19'3" d	25′9″ d 20′6″ d
		24"	1/120 1/240	21'3" d 17'0" d	22'6" f 18'0" d

Limiting height for ½" or \"h" thick panels and 5 psf uniform load perpendicular to partition. Use two-layer heights for multi-layer assemblies. Limiting criteria: d—deflection, f—bending stress. Consult local code authority for limiting criteria.

limiting height-steel stud assemblies

stud desig.	stud width	stud spacing	allow. defi.	partition, one layer	partition, two layers	furring, one layer
IISG Stat	ei Studs (Sī	T)				
158ST	15/8"	16"	1/120 1/240	10'9" f 9'6" d	10'9" d 10'6" d	10'3" d 8'3" d
	,	24"	1/120 1/240	8'9" f 8'3" d	8'9" f 8'9" f	8′9″ f 7′3″ d
212ST	21/2"	16"	1/120 1/240	13'9" f 12'6" d	13'9" f 13'6" d	13'9" d 11'0" d
		24"	1/120 1/240	11'3" f 10'9" d	11′3″ f 11′3″ f	11'3" f 9'9" d
358ST	35/8"	16"	1/120 1/240	16'9" f 16'0" d	16'9" f 16'9" f	16'9" f 14'6" d
		24"	1/120 1/240	13'6" f 13'6" f	13'6" f 13'6" f	13'6" f 12'9" d
400ST	4"	16"	1/120 1/240	17'3" f 17'3" d	17'3" f 17'3" f	17'3" f 15'9" d
		24"	1/120 1/240	14'3" f 14'3" f	14'3" f 14'3" f	14'3" f 13'9" d
600ST	6"	16"	1/120 1/240	20'0" f 20'0" f	20'0" f 20'0" f	20'0" f 20'0" f
		24"	1/120 1/240	16'3" f 16'3" f	16'3" f 16'3" f	16'3" f 16'3" f

USG Steel Studs (STL)

158STL	15⁄8″	24"	1/120 1/240	8'0" f 8'0" f	8'0" f 8'0" f	8'0" f 6'9" d
212STL	21/2"	24"	1/120 1/240	9'9" f 9'9" f	9′9″ f 9′9″ f	9'9" f 9'0" d
358STL	35/8"	24"	1/120 1/240	12'0" f 12'0" f	12'0" f 12'0" f	12'0" f 12'0" f

USG Steel Studs (CWS)

212CWS	21/2"	16"	1/120 1/240	17'9" d 14'0" d	18'6" d 14'9" d	16'6" d 13'0" d
		24"	1/120 1/240	15'6" d 12'3" d	16'3" f 13'0" d	14'6" d 11'6" d
358CWS	35/8"	16"	1/120 1/240	23'0" d 18'3" d	24'0" d 19'0" d	21'9" d 17'3" d
		24"	1/120 1/240	20'0" d 16'0" d	20'9" f 16'6" d	19'0" d 15'0" d
400CWS	4"	16"	1/120 1/240	24'9" d 19'6" d	25'9" d 20'3" d	23'6" d 18'9" d
		24"	1/120 1/240	21'6" d 17'3" d	22'0" f 17'9" d	20'6" d 16'3" d
600CWS	6"	16"	1/120 1/240	33'6" d 26'6" d	34'6" d 27'6" d	32'3" d 25'6" d
		24"	1/120 1/240	29'3" d 23'3" d	29'6" f 24'0" d	28'0" d 22'3" d

USG Steel Studs (SJ and CS)

OGG SIEE	i ornas le	o and oo,				
35SJ22	31/2"	16"	1/120 1/240	22'3" d 17'9" d	23'3" d 18'6" d	21'0" d 16'9" d
		24"	1/120 1/240	19'6" d 15'6" d	20'3" d 16'0" d	18'6" d 14'6" d
35SJ20	31/2"	16"	1/120 1/240	23'6" d 18'6" d	24'3" d 19'3" d	22'3" d 17'9" d
		24"	1/120 1/240	20'6" d 16'3" d	21'3" d 16'9" d	19'6" d 15'6" d
362SJ20	35/8"	16"	1/120 1/240	24'3" d 19'3" d	25'0" d 19'9" d	23'0" d 18'3" d
		24"	1/120 1/240	21'0" d 16'9" d	21'9" d 17'3" d	20'3" d 16'0" d
40SJ20	4"	16"	1/120 1/240	25′9″ d 20′6″ d	26'9" d 21'3" d	24'9" d 19'9" d
		24"	1/120 1/240	22'6" d 18'0" d	23'3" d 18'6" d	21'6" d 17'3" d
35CS18	31/2"	16"	1/120 1/240	21'6" f 18'6" d	21'6" f 19'3" d	21'6" f 17'9" d
		24"	1/120	17'6" f 16'3" d	17'6" f 16'9" d	17'6" f 15'6" d

Limiting height for ½" or 56" thick panels and 5 psf uniform load perpendicular to partition or furring. Use one-layer heights for unbalanced assemblies; use two-layer heights for multilayer assemblies. Limiting criteria: d—deflection, f—bending stress. Consult local code authority for limiting criteria.

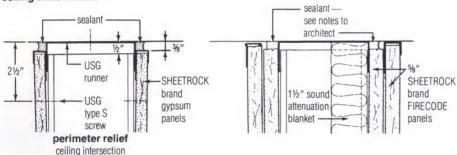
9.5/Nd

technical data/details

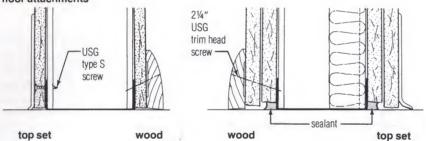
sound transmission loss—db

	band	cente	er freq	uency-	—Hz												3.1		17	100		
method	125	160	175	200	250	315	350	400	500	630	700	800	1000	1250	1400	1600	2000	2500	2800	3150	4000	STC
Lab	39	41	_	46	52	53	_	56	57	60	_	61	63	64	_	65	62	56		55	57	58
Lab	31	40	_	41	47	50	_	53	57	59	_	60	63	63	_	62	60	59	-	61	65	55
Lab	33	_	43	_	48	_	49	_	56	_	57	_	60	_	60	_	63	_	60	_	60	55
Lab	34	36	_	46	47	51	_	55	56	56	_	60	61	60	_	63	59	52	-	54	57	55
Lab	32	_	39	_	44	_	48	_	55	_	56	_	57	_	59	_	62	_	58	_	56	54
Lab	29	38	_	40	46	49	_	54	56	58	_	60	62	63	_	61	62	61	_	63	64	53
Lab	26	35	_	37	43	47	_	51	54	55	_	57	56	56	-	59	58	58	_	56	58	53
Lab	36	36	_	42	45	49	_	52	55	56	_	58	59	58	_	58	47	46	_	51	53	50
Lab	31	31	_	38	43	48	_	51	53	54	_	56	58	57	_	59	54	47	_	47	50	50
Lab	34	30	_	37	41	42	_	48	51	52	_	53	54	55	_	56	46	45	_	48	52	48
Lab	34	33	_	38	42	46	_	49	53	53	_	52	58	58	_	57	45	44	_	48	49	48
Lab	28	27	_	37	40	44	_	48	51	53	_	56	57	59	_	60	55	46	_	45	48	48
Lab	21	29	_	32	35	40	_	45	48	51	_	53	55	57	_	58	56	49	_	42	43	45
	Lab	method 125 Lab 39 Lab 31 Lab 34 Lab 32 Lab 29 Lab 26 Lab 36 Lab 31 Lab 34 Lab 34 Lab 28	method 125 160 Lab 39 41 Lab 31 40 Lab 34 36 Lab 32 — Lab 29 38 Lab 26 35 Lab 36 36 Lab 31 31 Lab 34 30 Lab 34 30 Lab 28 27	method 125 160 175 Lab 39 41 — Lab 31 40 — Lab 33 — 43 Lab 34 36 — Lab 32 — 39 Lab 29 38 — Lab 26 35 — Lab 36 36 — Lab 31 31 — Lab 34 30 — Lab 34 33 — Lab 28 27 —	method 125 160 175 200 Lab 39 41 — 46 Lab 31 40 — 41 Lab 33 — 43 — Lab 34 36 — 46 Lab 32 — 39 — Lab 29 38 — 40 Lab 26 35 — 37 Lab 36 36 — 42 Lab 31 31 — 38 Lab 34 30 — 37 Lab 34 33 — 38 Lab 34 33 — 38 Lab 28 27 — 37	Lab 39 41 — 46 52 Lab 31 40 — 41 47 Lab 33 — 43 — 48 Lab 34 36 — 46 47 Lab 32 — 39 — 44 Lab 29 38 — 40 46 Lab 26 35 — 37 43 Lab 36 36 — 42 45 Lab 31 31 — 38 43 Lab 34 30 — 37 41 Lab 34 33 — 38 42 Lab 28 27 — 37 40	method 125 160 175 200 250 315 Lab 39 41 — 46 52 53 Lab 31 40 — 41 47 50 Lab 33 — 43 — 48 — Lab 34 36 — 46 47 51 Lab 32 — 39 — 44 — Lab 29 38 — 40 46 49 Lab 26 35 — 37 43 47 Lab 36 36 — 42 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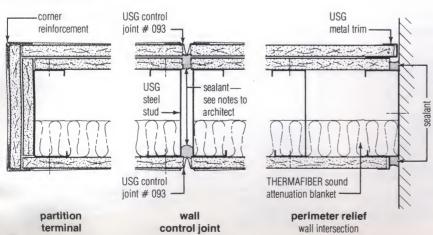
ceiling attachments



floor attachments

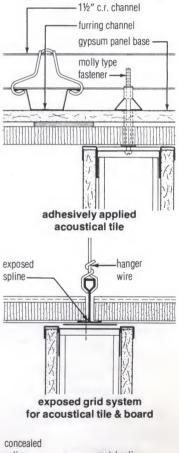


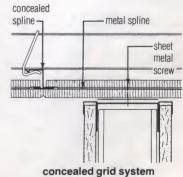
wall plan sections



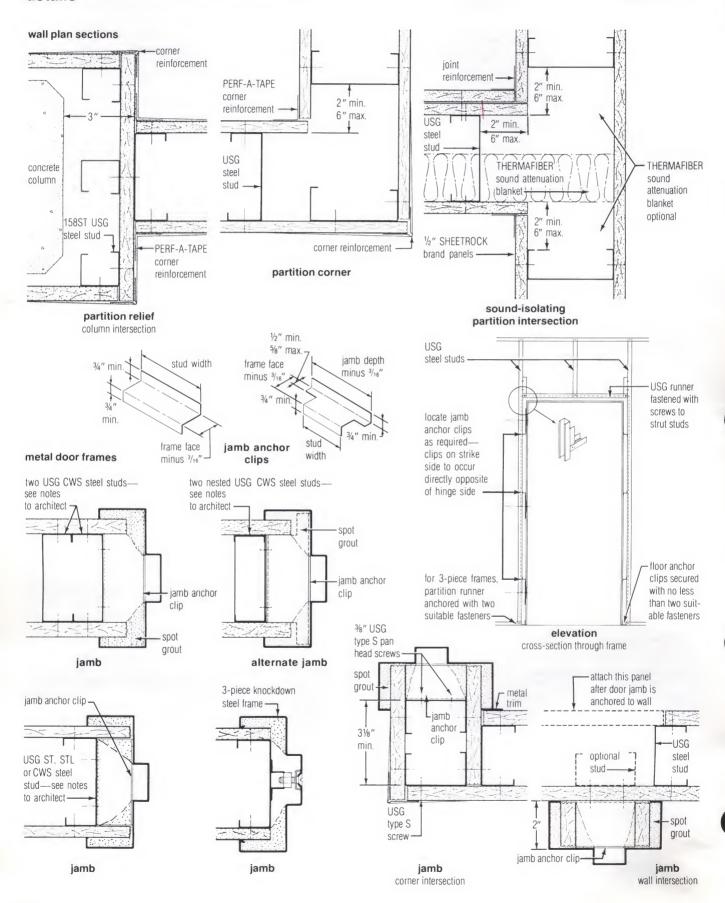
wall intersection

attachment of partition to ceiling





for acoustical tile



USG Steel-Framed Drywall Systems SA-923

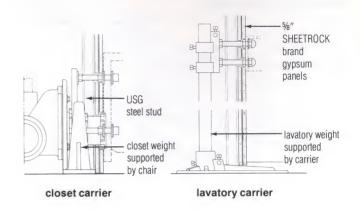
details

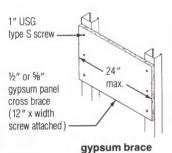
USG steel stud chase wall

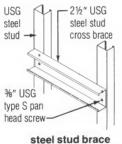
Chase walls provide vertical shafts where greater core widths are needed for pipe chase enclosures and other service installations. They consist of a double row of steel studs with gypsum panel cross braces between rows. Double-layer ½" SHEETROCK Brand Panels are screw-applied on both sides of studs and 1½" THERMAFIBER Sound Attenuation Blankets are stapled to the back side of one base layer. The assembly offers 55 STC, suitable for party walls, and a 2-hour fire-resistance rating when ½" SHEETROCK Brand FIRECODE "C" Gypsum Panels are used.

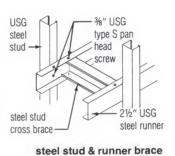
As an alternate, 2%" steel stud cross braces screw-attached to chase wall studs may be used. When chase wall studs are not directly opposite, steel stud cross braces 24" o.c. are anchored to continuous horizontal 2%" runners screw-attached to chase wall studs.

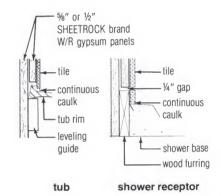
Limiting thickness is 24"; vertical brace spacing 48" o.c. max.; limiting heights are shown on page 4. Other chase walls providing greater height may be constructed with wider or heavier steel studs (see tables, page 4, for design data). Minimum panel size is ½"x4'x ceiling height.











USG drywall soffit

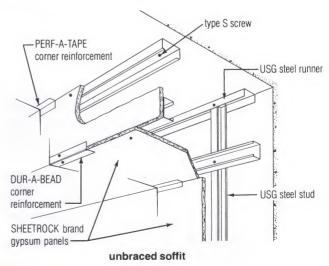
This assembly consists of galvanized steel channel runners and studs faced with Sheetrock Brand Gypsum Panels, screw attached. It is a lightweight, fast and economical method of filling over cabinets or lockers and of housing overhead ducts, pipes or conduits. The braced system permits constructing soffits with depths of 48" (vertically) and widths to 72" (horizontally) without supplementary vertical studs. The unbraced system is for soffits up to 24"x 24".

USG steel runner fasteners not to exceed 24" o.c.type S close to runner side PERF-A-TAPE screws corner steel runner reinforcement USG steel stud 24" o.c. 1/2" or 5/8" SHEETROCK brand gypsum panels 1/2" or 5/8 DUR-A-BEAD gypsum type S corner panel reinforcement USG steel runner attached 24" o.c. braced soffit

construction recommendations-maximum dimensions (1):

	um board ness (2)	maxii width		max. depth for max. width show			
in	mm	in	mm	in	mm	in	mm
1/2	12.7	15/8	41.3	60	1500	48	1200
1/2	12.7	21/2, 35/8	63.5, 92.1	72	1800	36	900
5/8	15.9	15/8	41.3	60	1500	30	800
5/8	15.9	21/2, 35/8	63.5, 92.1	72	1800	18	500

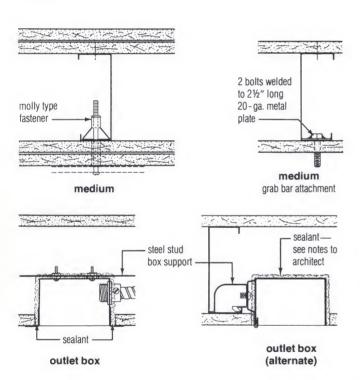
- (1) The construction is not designed to support loads other than its own dead weight and should not be used where it may be subjected to excessive abuse.
- (2) The double-layer system and $\%^{\prime\prime}$ thick gypsum panels are not recommended for this construction.



fixture attachment load table

fastener				allow		allowable			
	size			resist		resistance			
type	in	mm	- base assembly	lb	N (1)	ib	N (1)		
molly or toggle bolt	1/8 3/16 1/4	6.35 3.18 ½" gypsum panel		20 30 40	89 133 178	40 50 60	178 222 267		
bon	1/8 3/16 1/4			70 80 155	311 356 689	100 125 175	445 556 778		
no. 8 sheet metal screw			1/2" gypsum panel & ST steel stud or 25-ga. steel insert	50	222	80	356		
two bolts	3/16	4.76	see grab bar	175	778	200	890		
welded to steel insert	1/4	6.35	attachment below	200	890	250	1112		
bolt welded to 11/2" chan.	1/4	6.35	see plumber's bracket below	200	890	250	1112		

(1) Newtons

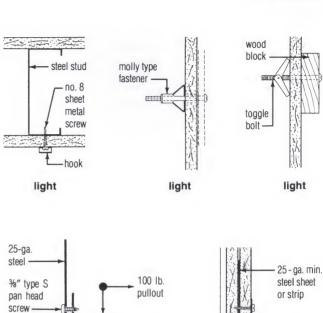


USG shelf-wall system

This system provides load-carrying walls for shelving in stores, offices, schools and other applications where required. Incorporating simple, quickly erected, economical steel stud components with Garcy shelf brackets, standards and accessories, the assembly offers all the advantages of steel stud-drywall construction plus the structural strength to support shelving and merchandise.

In this assembly, 35%" USG Steel Studs spaced no more than 24" o.c. are securely fastened to floor and ceiling runners and surfaced with either single or double-layer SHEETROCK Brand Panels. Slotted standards are screw-fitted to studs or steel reinforcing inserted between layers.

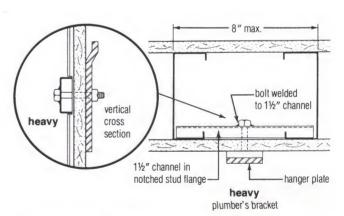
The system provides a load-carrying partition but is not structurally load-bearing. Limiting height: 16 ft.



180 lb. shear

metal-to-metal

25-ga. steel -

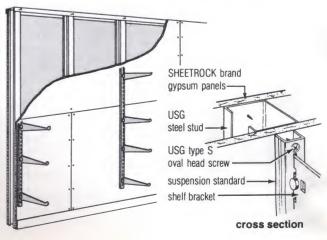


SHEETROCK brand

gypsum

panel

light



column fireproofing/test data

fire rating	column type	description	test no.		comments
2 hr.	W10 X49	Gypsum Drywall Fireprfg—½" SHEETROCK brand FIRECODE "C" panels around col—double layer over ea flange end—double layer on flange faces separ by USG 158ST steel studs & screw att—met beads on corners—joints fin†	UL Des X518 (was 10-2 hr)	(f)	
2 hr.	W14 X228	Gypsum Drywall Fireprfg—1/2" SHEETROCK brand FIRECODE "C" panels around col—panels screw att to 158ST steel studs at col corners—met corner beads—joints fin†	UL Des X521 (was 23-2 hr)	(f)	
2 hr.	varies	Gypsum Drywall Fireprfg—3 layers ½" SHEETROCK brand FIRECODE "C" panels around col—triple layer over ea flange end—inner layers on flange face separ by 158ST steel studs & screw att—met beads on corners—joints fin†	UL Des X524	(f)	Rating applies to tapered or constant- section prefabricated metal building columns
3 hr.	W10 X49	Gypsum Drywall Fireprfg—3 layers ½" SHEETROCK brand FIRECODE "C" panels around col—triple layer over ea flange end—inner layers on flange face separ by 158ST steel studs & screw att—met beads on corners—joints fin†	UL Des X515 (was 41-3 hr)	(f)	
3 hr.	W14 X228	Gypsum Drywall Fireprfg—½" SHEETROCK brand FIRECODE "C" panels around col—double layer over ea web face—panels screw att to 158ST steel studs at col corners—met corner beads—joints fin†	UL Des X514 (was 40-3 hr)	(f)	
4 hr.	W14 X228	Gypsum Drywall Fireprtg—2 layers ½" SHEETROCK brand FIRECODE "C" panels around col—panels screw att to 158ST steel studs at col corners—met corner beads—joints fin†	UL Des X507 (was 48-4 hr)	(f)	

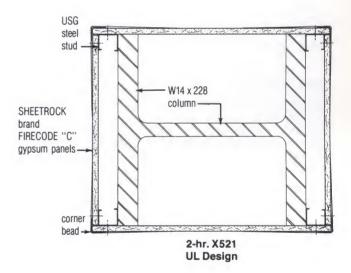
†Fire rating also applies with IMPERIAL FIRECODE "C" Gypsum Base and veneer finish surface.

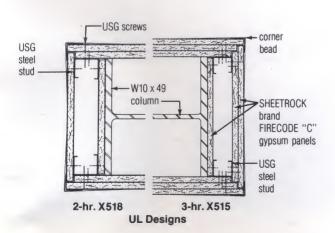
description

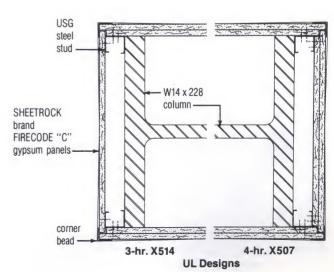
Drywall systems for column fireproofing consist of Sheetrock Brand Firecode "C" Gypsum Panels screw-attached to 15%" steel studs at column corners. Dur-A-Bead or #800 Corner Bead concealed with a U.S.G. joint compound resists damage from impact at exterior corners.

These systems are easily and quickly installed without waiting for adhesives to dry. They provide lightweight, thin, compact steel column fire protection of up to four hours depending on the construction. Increased fire protection of primary structural framing members usually permits lower insurance premiums.

In these assemblies, a hard and abrasion-resistant surface may be obtained with a thin veneer ($^{1}/_{16}$ " to $^{3}/_{32}$ " thick) of specially formulated, high-strength veneer finish. IMPERIAL Plaster is applied over IMPERIAL FIRECODE "C" Gypsum Base in lieu of gypsum panels. (See System Folder SA-912 for other IMPERIAL Systems.)







exterior wall furring

description	comments	
USG Metal Furring Channels 24" o.c., 1/2" Foil-Back SHEETROCK Brand Gypsum Panels screw-attached, joints finished	Good vapor retarder; no limiting height	A
USG Z-Furring Channels applied vertically 24" o.c., THERMAFIBER Z-Furring insulation between channels, ½" Foil-Back SHEETROCK Brand Gypsum Panels screw-attached to channels, joints finished	Noncombustible system with mineral fiber insulation; suitable for up to 3" thick insulation; good vapor retarder; no limiting height	В
USG Steel Studs 24" o.c., set in runners, ½" Foil-Back SHEETROCK Brand Gypsum Panels screw-attached to studs, joints finished	Free-standing; allows for pipe chase clearance; good vapor retarder	С
USG Z-Furring Channels applied vertically 24" o.c., FOAMULAR Extruded Polystyrene Insulation between channels, ½" Foil-Back SHEETROCK Brand Gypsum Panels applied vertically and screw-attached to channels, joints finished	Suitable for up to 3" thick insulation; no limiting height.	D

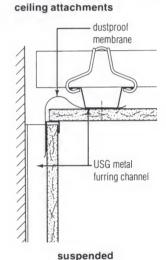
scale: 3" = 1'-0"

Exterior walls are readily furred using ½" Foil-Back SHEETROCK Brand Panels screw-attached to steel framing erected vertically. The foil-back panel provides an effective, low-cost vapor retarder which meets ASTM requirements for vapor permeance not exceeding 0.06 perms. In addition, foil-back panels have an emittance value of 0.05, which is used in conjunction with ASHRAE Handbook of Fundamentals for determining the thermal insulation value of a system when the foil faces a plane of air space of ½" to 3½". In these systems, either of three different framing methods may be used to provide a vapor retarder, thermal insulation, and chase space for pipes, conduits and ducts.

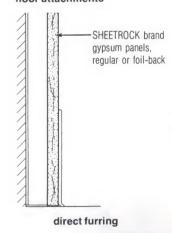
SHEETROCK Brand Panels also provide an easily decorated facing when directly applied to interior masonry walls. See Gypsum Panels Product Folder SA-927 in this series for application methods and specifications.

with USG Metal Furring Channels

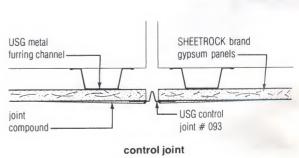
These furring channels, erected vertically 24" o.c., are fastened directly to interiors of exterior walls or monolithic concrete and virtually any type of masonry—brick, concrete block, tile. With Foil-Back Sheetrack Brand Gypsum Panels screw-attached to channels, this economical system provides an excellent vapor retarder and a durable, easily decorated interior surface.



floor attachments



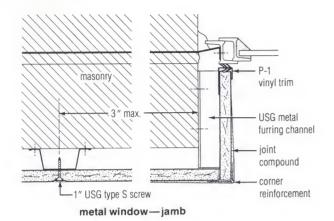
ceiling

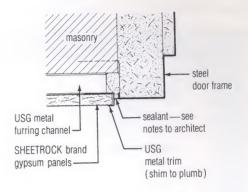


scale: $\frac{1}{4}'' = \frac{1}{-0}''$ wall elevation SHEETROCK brand gypsum panels, regular or foil-back-USG furring channels 161 -furring channel anchors staggered on opposite flanges 1" USG 16 type S screws perpendicular parallel application application

exterior wall furring

furred wall plan sections





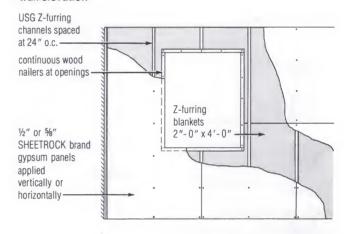
jamb-steel door frame

with USG Z-Furring Channels

In this assembly, USG Z-Furring Channels spaced 24" o.c. are used to mechanically attach Thermafiber Z-Furring Blankets or rigid foam insulation to interiors of exterior walls. The insulation panels are applied progressively as Z-Furring channels are attached to the wall. Gypsum panels are screw-attached to channel flanges to provide a drywall surface isolated to a great degree from the masonry wall. In new construction and remodeling, this system provides a highly insulative self-furring solid backup for Sheetrack Brand Panels.

USG Z-Furring Channels, suitable for 1" to 3" thick insulation, are formed from hot-dipped galvanized steel for added corrosion resistance. Fire-resistant THERMAFIBER Z-Furring Blankets provide a noncombustible assembly and offer low heat transmission. Blankets are a semi-rigid spun mineral fiber mat that meets requirements for Class A construction. For other applications, FOAMULAR Extruded Polystyrene Insulation offers a range of thicknesses and insulating values. Thermal resistance (R) values for various assemblies are shown below.

wall elevation



design thermal resistance (R) values (1)

				wall insula	ated with-						
wall construction	nom. wall thickn.	unfin. wall	furred wall (2) (no. insul.)	THERMAFIBER Z-Furring Blankets				FOAMULAR extruded polystyrene			
				1" (4.17)	1½" (6.00)	2" (8.00)	3" (12.00)	1" (5.41)	1½" (8.12)	2" (10.82)	3″ (16.23)
4" face brick 8" block	12"	3.01	4.38	7.63	9.46	11.46	15.46	8.87	11.58	14.28	19.69
4" face brick 4" com. brick	8"	2.09	3.46	6.71	8.54	10.54	14.54	7.95	10.66	13.36	18.77
poured conc. 140 lb./cu. ft.	8"	1.49	2.86	6.11	7.94	9.94	13.94	7.35	10.06	12.76	18.17
cinder block	8"	2.57	3.94	7.19	9.02	11.02	15.02	8.43	11.14	13.84	19.25

⁽¹⁾ Resistances based on procedures and design values from 1981 ASHRAE Handbook of Fundamentals, winter conditions (15 mph wind) and neglect the effect of furring channels and fasteners. (2) Interior wall finish: ½° Foil-Back SHEETROCK Brand Gypsum Panels (R-0.45). R-values for insulation, shown in parentheses, based on 40°F. mean temperature for FOAMULAR Insulation and 75°F. mean temperature for other insulation and components. R-value for 1" thick FOAMULAR Insulation is 5.0 at 75°F. mean temperature.



installing insulation



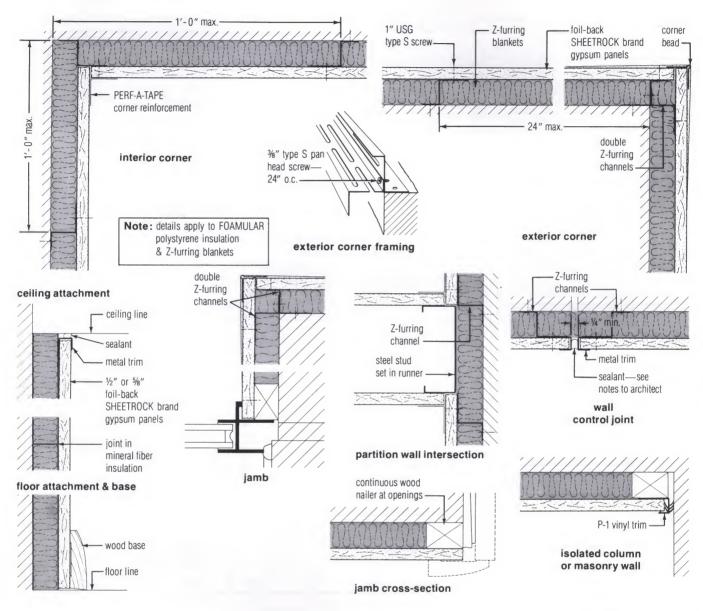
attaching Z-furring channel



erecting gypsum panel



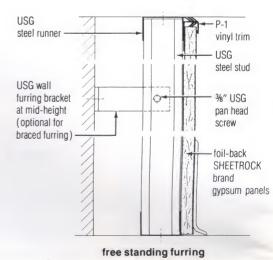
screw-attaching panel



with USG Steel Studs

Free-standing furring consists of USG Steel Studs erected vertically between floor and ceiling runners. Foil-Back Sheetrock Brand Panels screw-attached to one side of studs, serves as an easily decorated interior surface. This free-standing furring system provides maximum clear chase space and minimizes possibilities for photographing or shadowing to occur over fasteners and furring members.

This assembly consists of 1%" stud framing which may be secured to the exterior wall with brackets at mid-height when greater heights are required. The USG Adjustable Wall Furring Bracket is anchored to the exterior wall and attached to each stud web with a %" Type S pan head screw. With the furring bracket, the limiting height is 12 ft. Other furring providing greater height may be constructed with wider or heavier steel studs (see tables, page 4).



ceilings/test data

	fire-rated construction	acoustical performance					
fire rating	description & test no.	STC	IIC	description & test no.			
N/A	5/4" SHEETROCK brand FIRECODE gypsum panels—11/2" cr chan 4' o.c.—USG met fur chan 3	24" o.c. clg wt 3	45		"Up and over" attenuation—suspension and ceiling membrane only—USG-5-FT-G&H	Α	
1 hr. (beam 1 hr.)	1/2" SHEETROCK brand FIRECODE "C" gypsum panels—USG 725SJ18 steel joists 24" o.c.—dlaver gyrsum panel clg and 5%" T&G plywd fir att to joists with Type S-12 screws—dbl layer	bl clg wt 4	39 43	56 60	Based on 95SJ16 joists—USC-760105 Based on 95SJ16 joists and 3" sound atten blankets"—USC-760310 Based on 95SJ16 joists and carpet & pad—USC-760106 Based on 95SJ16 joists and carpet & pad with 3" sound atten blankets"—USC-760405	В	
1½ hr.	%" SHEETROCK brand FIRECODE "C" gypsum panels—USG susp grid with main run 4' o.c. and cross tees 2' o.c.—gypsum panels screw-att below grid—joints fin—31/2" roof ins on 2" gypsum plank over bar joists— UL Des P506	clg wt 3	N/A			С	
1½ hr.	%" SHETROCK brand FIRECODE "C" gypsum panels—susp grid with main run 4' o.c. and cross tees 2' o.c.—gypsum panels screw-att below grid—joints stag and fin—min 1" roof insul and %" gypsum bd on stl deck over bar joists—1-hr. rating based on assembly with 1 base—UL Des P510	'2" thick clg wt 4	N/A			D	
2 hr. (beam 2 hr.)	1/2" SHEETROCK brand FIRECODE "C" gypsum panels—furred or susp—USG met fur chan o.c.—panels att with 1" Type S screws 12" o.c.—joints exp or fin—21/2" conc on riblath or cor still deck over bar joist— UL Des G515	24" rug clg wt 3	54		"Up and over"—based on furred interrupted ceiling, 11/2" sound atten. blankets extending 4' beyond partition—USG-189-FT-G&H	Ε	
2 hr. (beam 3 hr.)	½" SHEETROCK brand FIRECODE "C" gypsum panels—USG susp grid with main run 4' o.c and cross tees 2' o.c.—gypsum panels screw-att below grid—joints fin—2½" conc on riblath bar joist—UL Des G529	over clg wt 3	N/A			F	
2 hr.	5%" SHEETROCK brand FIRECODE "C" gypsum panels—USG met fur chan 24" o.c.—panels with 1" Type S screws—joints fin—2" prestressed reg or lightwt conc units with 6" deep stems—UL Des J502—UL Des J503	att 48" o.c. clg wt 3	N/A			G	
3 hr. (beam 3 hr.)	½" SHEETROCK brand FIRECODE "C" gypsum panels—USG susp grid with main run 4' o.c and cross tees 2' o.c.—gypsum panels screw-att below grid—joints fin—3½" conc on riblath bar joist—rating also applies with %" panels and 2¾" conc slab—UL Des G529	over clg wt 3	N/A			Н	
3 hr.	%" SHEETROCK brand FIRECODE "C" gypsum panels—USG met fur chan 24" o.c.—panels with 1" Type S screws—joints fin—prestressed 2%" reg or 21/2" lightwt conc units with 6" deep stems 48" o.c.—UL Des J502—UL Des J503—UL Des J504	att clg wt 3	N/A			-	
3 hr. (beam 3 hr.)	%" SHEETROCK brand FIRECODE "C" gypsum panels—USG met fur chan 24" o.c.—panels with 1" Type S screws 12" o.c.—joints exp or fin—2½" conc on riblath over bar joist— UL Des G512	att clg wt 3	N/A			J	
		*Insulation may affect fire rating. See SA-905.					

*Insulation may affect fire rating. See SA-905.

beam applications

fire rating	fire-rated construction description & test no.	beam type	comments			
2 hr. (beam only)	Gypsum Drywall Caged Beam Fireprig—1%" USG stl run chan brackets 24" o.c.—13%" x 7%" comer angles att to chan brackets—dbl layer %" SHEETROCK brand FIRECODE gypsum panels att with Type S screws—met beads on corners—joints fin—2½" conc deck on fluted stl fir—UL Des N501—UL Des N502	W8 X24	Design N502 based on 154" steel runner for corner angles and coped brackets	К		
3 hr. (beam only)	Gypsum Drywall Caged Beam Fireprfg—15%" USG stl run chan brackets 24" o.c.—13%" x 7%" comer angles att to brackets—3 layers 5%" SHEETROCK brand FIRECODE gypsum panels att with Type S screws—1" 20-ga. hex mesh on bottom over middle layer —met beads on comers—joints fin—2½" conc deck on fluted stl flr— UL Des N505	W8 X24	Extends drywall use to beam protection. Fire rating for restrained assembly; 2-hour rating for unrestrained assembly	L		

description

These floor/ceilings consists of SHEETROCK Brand FIRECODE "C" Gypsum Panels screw-attached to USG Metal Furring Channels clipped or wire-tied to suspended runner channels or wire-tied to supports. Panels are also screw-attached below the USG Direct Suspension System. For long spans to accommodate large ducts or pipes in the ceiling space, the USG Steel Stud is used as ceiling furring or in a separate system (see table, page 15.)

The USG Steel Stud Framing System is ideal for ceilings over office areas in pitched-roof buildings and in modular buildings where ceiling framing is independent of the floor above; accommodates light troffers, ducting and electrical services.

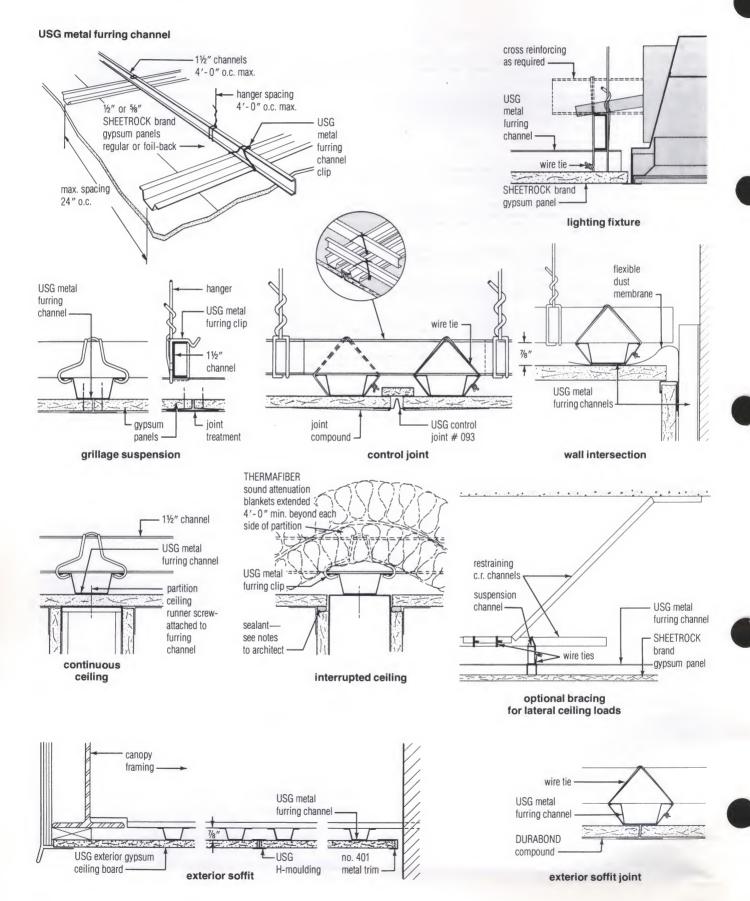
Gypsum panels for these assemblies are available in ½" and ½" thicknesses and in five types (see Specifications, page 16). Foil-Back Gypsum Panels offer an effective vapor retarder. Regular gypsum

panels provide a firm base of acoustical tile adhesively applied. USG Exterior Gypsum Ceiling Board is suitable for exterior ceilings and soffits with indirect weather exposure.

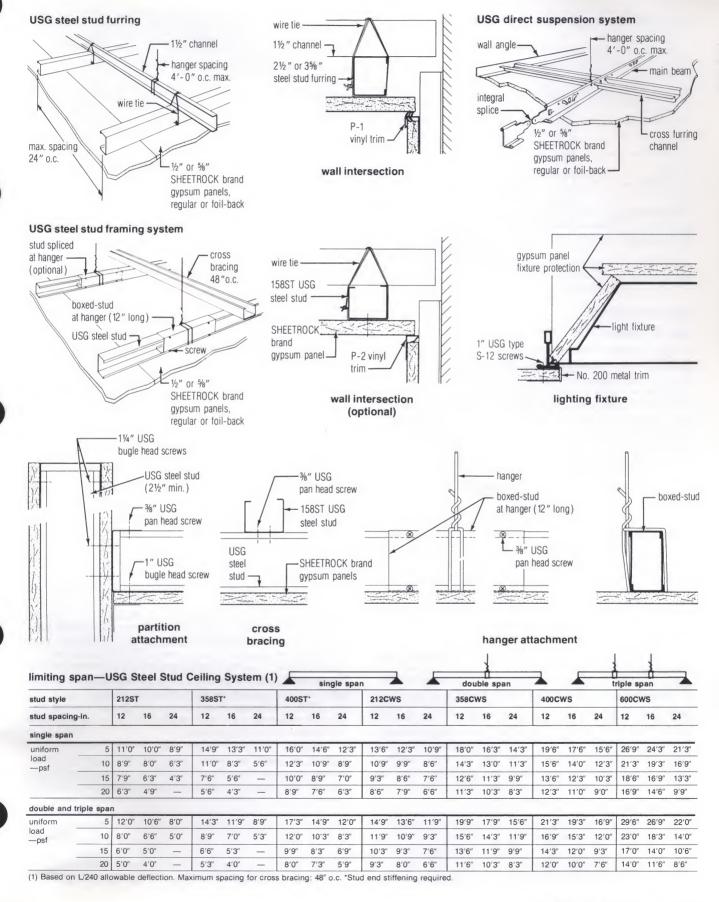
limitations

USG Steel Studs are not designed to carry live loads, mechanical equipment or material storage (see load table below and details, page 15). Maximum spacing: main support members and hangers 48" o.c. For single-layer panels, maximum steel stud and furring channel spacing is 24" o.c. for perpendicular application and 16" o.c. for parallel application. For panels used as base for spray-applied texture finish, maximum frame spacing is 16" o.c. for ½" thick panels perpendicularly applied; parallel panel application not recommended.

details scale: 3" = 1"-0"



details



beam protection (beam only) 3-hr, UL design no. N505 (restrained) 2-hr. UL design no. N505 (unrestrained) 2-hr. UL design no. N502 2-hr. UL design no. N501 21/2" sand-gravel concrete 21/2" sand-gravel concrete 21/2" sand-gravel concrete 11/2" fluted steel floor units 11/2" fluted steel floor units 11/2" fluted steel floor units 13/8" x 7/8" USG protective material protective metal angle runner material 158CR USG 11/4" USG steel runners 158CR USG type S screw 1", 15%", 21/4" steel runners USG type S screws 1%" USG 11/4" USG type S screw type S screw upturned wire wire mesh corner mesh 11/2" 1%" USG reinforcement corner type S screw reinforcement 13%" x 7%" USG %" SHEETROCK corner metal angle runner 13%" x 7%" USG %" SHEETROCK brand FIRECODE reinforcement metal angle runner brand FIRECODE gypsum panels 158CR USG gypsum panels. steel runner

specifications

notes to architect

- 1. System Performance—U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.
- 2. Control Joints—Gypsum panel surfaces should be isolated with control joints or other means where: (a) partition, furring or column fireproofing abuts a structural element (except floor) or dissimilar wall or ceiling; (b) ceiling abuts a structural element, dissimilar wall or partition or other vertical penetration; (c) construction changes within the plane of the partition or ceiling; (d) partition or furring run exceeds 30'; (e) ceiling dimensions exceed 50' in either direction with perimeter relief, 30' without relief; (f) exterior soffits exceed 30' in either direction; (g) wings of "L", "U" and "T"-shaped ceiling areas are joined; (h) expansion or control joints occur in the base exterior wall.

Ceiling height door frames may be used as control joints. Lessthan-ceiling height frames should have control joints extending to the ceiling from both corners. If control joints are not used, additional reinforcement is required at corners to distribute concentrated stresses.

- 3. Penetrations of the gypsum panel diaphragm such as borrowed lights, access panels, light troffers, require additional reinforcement at corners to distribute concentrated stress if a control joint is not used.
- 4. Metal door and borrowed-light frames should be at least 18-ga. steel, shop primed, and have throats accurately formed to overall thickness of partition. They should be anchored at floor with 16-ga. steel plates welded to trim flanges, with provision for two power-driven anchors or equal per plate. Jamb anchor clips should be 18-ga. steel welded in a jamb (see details, page 6). Stud reinforcing described below is screw-attached to jamb anchor clips. Three-piece frames may also be used with these partitions provided end of partition floor runner is anchored with two suitable fasteners.

For standard doors up to 3'0" wide weighing not more than 100 lb., ST or STL (3%" only) steel studs and runners may be used for framing the opening. For doors 2'8" to 4'0" wide (200 lb. max.) rough framing should be CWS studs (3%" min.) and runners. For heavy doors up to 4'0" wide (300 lb. max.), two CWS studs should be used (see details, page 6). For doors over 4'0" wide, double doors and extra-heavy doors

(over 300 lb.), framing should be specially designed to meet load conditions. Rough framing for all doors in fire-rated partitions should be CWS studs and runners.

For added door frame restraint, spot-grouting at the jamb anchor clip is recommended. Spot-grouting is required for solid-core doors and doors over 2'8" wide. Apply DURABOND Joint Compound just before inserting board into frame; do not terminate gypsum panel against trim return.

- 5. Pipe and Conduit Chases—Additional chases can be provided in steel studs (except in fire-rated construction) by cutting round holes up to ¾ of stud width, spaced 12" apart.
- **6. Ceramic Tile**—SHEETROCK Brand W/R Gypsum Panels are recommended as a base on walls for adhesive application of ceramic and plastic tile and plastic-faced wall panels.
- 7. Fixture Attachment—Lightweight fixtures should be installed with toggle or molly bolts inserted in the panel and preferably, also through the stud. Wood or metal mounting strips for cabinets and shelving should be bolted to the stud framing (see details, page 8).
- 8. Wood Base—Apply with trim head screws placed at each stud and midway between studs (12" o.c.).
- 9. Sound tests are conducted under ideal laboratory conditions per ASTM procedures. Comparable field performance depends on building design and careful attention to detailing and workmanship. Where these partitions are used for sound control, USG Acoustical Sealant is recommended to seal the partition and all cut-outs such as electrical boxes. Back-to-back penetrations of the diaphragm, flanking paths, door and borrowed-light openings should be avoided.
- 10. TEXTONE Gypsum Panels—For adhesive applications, only water-based adhesives are recommended; other adhesives may not be compatible with the vinyl surface.
- 11. Ceilings—Spacing of hangers and channels is designed to support only the dead load. Heavy concentrated loads should be independently supported. To prevent objectional sag in new gypsum panel ceilings, the weight of overlaid unsupported insulation should not exceed 1.3 psf for ½" thick panels with frame spacing 24" o.c.; 2.2 psf for ½" panels on 16" o.c. framing and ¾" panels on 24" o.c. framing. Foil-back panels or a separate vapor retarder should be installed in all exterior ceilings, and the plenum or attic space vented with a min. ½-sq. in. net free vent area per sq. ft. of horizontal surface. Framing for exterior soffits should provide resistance to wind uplift.
- 12. Fire-rated Ceilings-To comply with UL Floor-Ceiling Designs

USG Steel-Framed Drywall Systems SA-923

G512 and G515, gypsum panel end joints should be aligned and backed by 2" wide face panel strips laid over the joints. Face panels should be fastened to continuous furring channels centered 2" either side of joints. For UL Designs J502, J503, and J504, end joints should be backed by 3" wide strips and furring channels centered 3¼" either side of joints.

- 13. Back-blocking of ceiling end joints is recommended when construction occurs during adverse job or weather conditions. Float end joints between furring channels and back-block joint with a continuous 8" face panel strip adhesively applied, or screw-attach floated ends to a 5-ft. channel centered over joint.
- **14.** Acoustical Tile—Treatment of joints and screwheads with joint compound may be omitted where gypsum panels serve as a base for adhesively applied acoustical tile.
- 15. USG Exterior Gypsum Ceiling Board—Exposed surfaces should receive two coats of good quality exterior paint. First coat: oil-based primer; second coat: either alkyd or latex exterior paint.
- 16. Shadowing—During periods of low outside temperature, condensation may form on exterior walls, collecting airborne dirt to produce photographing or shadowing over fasteners and furring. This natural phenomenon occurs through no fault of the products.
- 17. Furring Systems—Shallow electrical outlet boxes are recommended when insulation less than 11/2" thick is used.
- **18. WARNING: COMBUSTIBLE.** FOAMULAR Polystyrene Insulation and other rigid foam insulation will ignite if exposed to fire of sufficient heat and intensity. Use only as directed by the specific instructions accompanying the product.
- 19. High-rise Buildings—Variable wind pressure can cause a structure to drift or sway. This can result in movement of the non-load bearing partitions, thus causing noise. United States Gypsum Company assumes no responsibility for the prevention, cause, or repair of these job-related noises.
- 20. Additional Information—See U.S.G. technical folders in this series and in Sweet's General Building File: Construction Selector SA-100 for fire and sound-rated systems; Gypsum Panels and Accessories Folder SA-927 for information on system components; Texture and Paint Products Folder SA-933 for finishing product specifications; Plasters, Bases and Accessories Folder SA-917 for information on veneer finish products; FOAMULAR Insulation Folder SA-710 for data on rigid polystyrene insulation.

Part 1: general

1.1 scope-Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

In cold weather and during gypsum panel joint finishing, temperatures within the building shall be maintained within the range of 55° to 70°F. (13° to 21°C). Adequate ventilation shall be provided to carry off excess moisture.

Part 2: products

2.1 materials

USG Steel Studs—158ST (15%"), 212ST (2½"), 358ST (35%"), 400ST (4"), 600ST (6"), 158STL (15%"), 212STL (2½"), 358STL (35%"),

- 212CWS (2½"), 358CWS (35%"), 400CWS (4") 600CWS (6"), 35SJ22 (3½"), 35SJ20 (3½"), 362SJ20 (35%"), 40SJ20 (4"), 35CS18 (3½"), lengths as required.
- b. USG Steel Runners—158CR (15/6"), 212CR (2½"), 358CR (35/6"), 400CR (4"), 600CR (6"), 158CRL (15/6"), 212CRL (2½"), 358CRL (35/6"), 400CRL (4"), 600CRL (6"), 212CWR (2½"), 358CWR (35/6"), 400CWR (4"), 600CWR (6"), 35CR22 (3½"), 35CR20 (3½"), 362CR20 (35/6"), 40CR20 (4"), 35CR18 (3½").
- c. USG Metal Furring Channel.
- d. USG Metal Furring Channel Clip.
- e. USG Z-Furring Channel (1") (11/2") (2") (3").
- f. 11/2" Cold-Rolled Channels.
- g. Galvanized Hanger Wire (8-ga.) (12-ga.).
- h. 18-ga. Galvanized Tie Wire.
- i. USG Adjustable Wall Furring Bracket.
- j. Faceboards—(1/2") (5/6") thick, 48" wide SHEETROCK Brand (Regular) (Foil-Back) (FIRECODE "C") (SHEETROCK Brand W/R FIRECODE "C") (TEXTONE) Gypsum Panels, USG Exterior Gypsum Ceiling Board, lengths as required.
- k. Backing Board—1/4" SHEETROCK Brand Gypsum Panels.
- I. Insulation
 - —THERMAFIBER Sound Attenuation Blankets, (1") (11/2") (2") (3") x 24" x 48".
 - —THERMAFIBER Z-Furring Blankets, (1") (11/2") (2") (3") x24" x48".
 - —Foamular Extruded Polystyrene Insulation, (1") (1 $\frac{1}{2}$ ") (2") (3") x (24") x 96".

m. Adhesive

- —(for double-layer application and column fireproofing) DURABOND Joint Compound or USG Ready-Mixed Joint Compound (All Purpose) (Taping).
- -(for adhesive application) Drywall Stud Adhesive.
- n. Fasteners—USG Screws: %" Type S, pan head; %", ½" Type S-12, pan head; 5%" Type S-12 low-profile head; 7%", 1", 1½", 15/16", 15%", 17%", 2½" Type S, bugle head; 1", 15%", 2½" Type S or S-12, trim head; 1½" Type G, bugle head; 1½" Type W, bugle head; 1½" GWB-54 annular ring nail.
- o. USG Trim No. (200-A) (200-C) (401) (402) (P-1) (801-A) (801-B).
- p. USG Corner Bead—(No. 103 Dur-A-BEAD) (No. 104 Dur-A-BEAD) (No. 800) Metal Corner Reinforcement.
- q. USG Control Joint No. 093.
- r. Joint Treatment—(select a U.S.G. Joint System).
- s. Caulking-USG Acoustical Sealant.
- t. USG 1%" x 1/8" x 24-ga. Galvanized Metal Angles.
- u. USG Direct Suspension System
 - -Main Beam MB-12.
 - -Cross Furring Channel CFC-4.
 - ---Cross Beam CB-4.
 - -Wall Angle.

Part 3: execution

3.1 partition installation

3.1.1 stud system erection

Attach steel runners at floor and ceiling to structural elements with suitable fasteners located 2" from each end and spaced 24" o.c., or to suspended ceilings with toggle or molly bolts spaced 16" o.c.

Position studs vertically, with open side facing in same direction, engaging floor and ceiling runners, and spaced 24" o.c. When necessary, splice studs with 8" nested lap and one positive attachment per stud flange. Place studs in direct contact with all door frame jambs, abutting partitions, partition corners and existing construction elements. Where studs are installed directly against exterior walls and a possibility of water penetration through walls exists, install asphalt felt strips between studs and wall surfaces.

Anchor all studs for shelf-walls and those adjacent to door and window frames, partition intersections, and corners to ceiling and floor

specifications

runner flanges with USG Metal Lock Fastener tool or screws. Securely anchor studs to jamb and head anchor clips of door or borrowed-light frames by bolt or screw attachment. Over metal door and borrowed-light frames, place horizontally a cut-to-length section of runner, with a web-flange bend at each end, and secure to strut-studs with two screws in each bent web. Position a cut-to-length stud (extending to ceiling runner) at vertical panel joints over door frame header.

3.1.2 gypsum panel erection

Apply gypsum panels (parallel to studs) (perpendicular to studs). Position all edges over studs for parallel application; all ends over studs for perpendicular application. Use maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together. Stagger joints on opposite sides of partition.

Screw spacing that follows is for non-rated construction. For firerated construction, obtain screw spacing from fire test report or table, below.

For single-layer parallel application of gypsum panels, space screws 16" o.c. in field of panels and along vertical abutting edges. For perpendicular panel application, space screws 16" o.c. in field and along abutting end joints.

For single-layer adhesive application, pre-bow panels and attach vertically to studs using %" continuous adhesive beads applied to face of studs. Apply one bead to intermediate studs and two beads to studs occurring at panel joints. Secure panel at top and bottom with 1" Type S Screws spaced 16" o.c. Impact panel along each stud to insure good contact at all points.

For double-layer screw attachment, space screws 24'' o.c. in base layer and 16'' o.c. in face layer. Apply both layers of gypsum panels vertically with joints in face layer offset from base layer joints. For 5/6'' panels, use 1'' screws for base layer and 15/6'' screws for face layer. For 1/2'' panels, use 1/6'' screws for base layer and 15/16'' screws for face layer.

For double-layer laminated construction, attach base layer with 1" Type S Screws spaced 8" o.c. at joint edges and 12" o.c. in field. Apply face layer vertically with specified DURABOND Joint Compound or USG Ready-Mixed Joint Compound spread on back side, joints staggered approx. 12" and fastened to base layer with 1½" Type G Screws. Drive

screws approx. 2' from ends and 4' o.c. in field of panel, 1' from ends and 3' o.c. along a line 2" from vertical edges. Temporary shoring or support installed 16" to 24" o.c. until adhesive is dry may be used in place of screws.

For double-layer laminated non-rated construction, attach base layer with 1" Type S Screws spaced 16" o.c. at joint edges and in the field of panel. Apply Laminating Adhesive in strips to center and along both edges of gypsum face panel. Apply strips with a notched metal spreader having four \(^1/4\)" x \(^1/4\)" min. notches spaced max. \(^2/4\)" o.c. Position wall panels vertically, press into place with firm pressure to insure bond and fasten top and bottom as required. For ceiling panels, space fasteners \(^16\)" o.c. along edges and ends; install one permanent field fastener per framing member at mid-width of panel.

3.2 chase wall erection

Align two parallel rows of floor and ceiling runners spaced apart as detailed. Attach to concrete slabs with concrete stub nails or power-driven anchors 24" o.c., to suspended ceilings with toggle or molly bolts 16" o.c., or to wood framing with suitable fasteners 24" o.c.

Position steel studs vertically in runners, 24" o.c. with flanges in the same direction, and with studs on opposite sides of chase directly across from each other. Anchor all studs to floor and ceiling runner flanges with USG Metal Lock Fastener tool or screws.

Cut cross bracing to be placed between rows of studs from gypsum panels, 12" high by chase wall width. Space braces 48" o.c. vertically and attach to stud webs with six 1" Type S Screws per brace. If larger braces are used, space screws 8" o.c. max. on each side.

Bracing of 2½" steel studs may be used in place of gypsum panels. Anchor web at each end of steel brace to stud web with two ¾" pan head screws. When chase wall studs are not opposite, install steel stud cross braces 24" o.c. horizontally and securely anchor each end to a continuous horizontal 2½" runner screw-attached to chase wall studs within the cavity.

3.3 drywall soffit erection

Attach steel runners 24" o.c. to concrete slabs with concrete stub nails or power-driven anchors, to suspended ceilings with toggle bolts or

screw locations and spacing—fire-rated steel stud drywall partitions

	face layer app	olication		base layer application						
	USG screw			USG scre	w					
test number	length	type	spacing and location	length	type position		spacing and location			
U of C 6/15/65	15/8"	S	12" o.c. to studs at joints and in field, 12" o.c. to runners	1"	S		12" o.c. to studs at joints and in field, 12" o.c. to runners			
UL Des U411-2 hr.	11/2"	G	adhesive lamination (1) and supplementary screws	1"	S		8" o.c. to studs at joints, 12" o.c. to studs in field			
UL Des U411-2 hr.	15⁄8″	S	16" o.c. to studs at joints and in field, 12" o.c. to runners	1"	s		16" o.c. to studs at joints and in field			
UL Des U412-2 hr.	11/2"	G	adhesive strip lamination (1) and supplementary screws	1"	S		12" o.c. to studs at joints and in field			
UL Des U412 U of C 9/21/64	15⁄8″	S	12" o.c. to studs at joints and in field	1"	S		12" o.c. to studs at joints and in field			
UL Des U420	15⁄8″	S	8" o.c. to studs at joints 12" o.c. to studs in field	1"	S		8" o.c. to studs at joints, 12" o.c. to studs in field			
WHI 0236-0237	15⁄8″	S	12" o.c. to studs and runners	1"	S		24" o.c. to studs at joints and in field			
UL Des U435-3 hr. UL Des U435-4 hr.	21/4" 25/8" 11/2"	S S G	12" o.c. to studs 12" o.c. to studs between studs at horizontal joints	1" 15/8" 21/4"	S S S	1st layer 2nd layer 3rd layer	48" o.c. to studs			
T-3362 OSU	1"	S	12" o.c. to studs at joints and runners, 8" o.c. to studs in field							
T-1174 OSU U of C 7/31/62 GA-WP-45 1 hr.	1"	S	8" o.c. to studs at joints 12" o.c. to studs in field							

⁽¹⁾ Use DURABOND Joint Compound only.

USG Steel-Framed Drywall Systems SA-923

molly bolts or to wood framing with suitable fasteners. On stud walls, space fastenerage each stud. On ceilings, place fastener close to outside face runner. Fasten vertical face panel to web of face corner runner and flange of ceiling runner with 1" Type S Screws spaced 12" o.c. For braced furring, insert steel studs between face corner runner and sidewall runner and attach alternate studs to runners with USG Metal Lock Fastener tool or %" pan head screws. Attach bottom face panel to steel studs and runners with 1" Type S Screws spaced 12" o.c. Space screws in corner runner at least 1" from gypsum panel edge.

3.4 ceiling installation

3.4.1 grillage erection

Space 8-ga. hanger wires 48" o.c. along carrying channels and within 6" of ends of carrying-channel run. In concrete, anchor hangers by attachment to reinforcing steel, by loops embedded at least 2" or by approved inserts. For steel construction, wrap hanger around or through beams or joists.

Install 11/2" carrying channels 48" o.c., and within 6" of walls. Position channels for proper ceiling height, level, and secure with hanger wire saddle-tied along channel. Provide 1" clearance between runners and abutting walls and partitions. At channel splices, interlock flanges, overlap ends 12" and secure each end with double-strand 18-ga. tie wire.

Erect metal furring channels at right angles to 1½" carrying channels or main support members. Space furring (16") (24") o.c. and within 6" of walls. Provide 1" clearance between furring ends and abutting walls and partitions. Secure furring to carrying channels with clips or saddle-tie to supports with double-strand 18-ga. tie wire. At splices, nest furring channels at least 8" and securely wire-tie each end with double-strand 18-ga. tie wire.

At light troffers or any openings that interrupt the carrying or furring channels, install additional cross reinforcing to restore lateral stability of grillage.

3.4.2 steel stud framing system erection

Attach runners at ceiling height, through gypsum panels, to each partition stud with two screws. Insert steel studs in runners and attach each end with one %" pan head screw. Install 15%" stud cross-bracing over stud framing, space 48" o.c. and attach to each framing stud with two %" pan head screws. At hangers, install 12" long stud section for box reinforcing or lap studs 12" and secure each end with two 3%" pan head screws.

At light troffers or any openings that interrupt the ceiling, install additional cross reinforcing to maintain structural integrity of framing.

3.4.3 gypsum panel erection

Apply gypsum panels of maximum practical length with long dimension perpendicular to furring channels. Position end joints over channel web and stagger in adjacent rows.

Fit ends and edges closely, but not forced together. Fasten panels to channels with 1" Type S Screws spaced 12" o.c. in field of panels and along abutting ends and edges.

3.4.4 direct suspension system erection

Attach wall angles at ceiling height. Space 12-ga. hanger wires 48" o.c. along main beams, within 6" of beam ends and walls not having wall angles. Install main beams 48" o.c. within 6" of walls. Align main beam slots for cross furring channel and splice ends to insure continuity in each row.

Space cross furring channels 24" o.c. within 6" of walls without wall angles, at panel end joints and 8" from gypsum panel end joints. Snap-lock ends to main beam and secure ends to wall angles with positive attachment.

At light fixtures, place hangers at each corner and at mid span of

cross beams. Install two cross beams to support lighting fixture and additional cross furring channels 8" from each side of fixture.

Apply (½") (5%") SHEETROCK Brand FIRECODE "C" Panels of maximum practical length with long dimension perpendicular to cross furring channels. Center end joints under channels and stagger in adjacent rows. Fit ends and edges closely but not forced together. Fasten panels to beams and channels with 1" Type S-12 Screws spaced 12" o.c. in field of panels and along abutting ends and edges. Apply gypsum panel fixture protection over all light fixtures.

3.5 caged beam fireproofing

Position ceiling runners at least ½" from and parallel to beam and fasten to floor units with ½" Type S-12 Pan Head Screws spaced 12" o.c. Fabricate hanger brackets from 15%" steel runners allowing (½") (1") clearance at bottom of beam. Space brackets 24" o.c. along beam and attach to ceiling runenrs with ½" Type S-12 Screws. Install lower corner runners parallel to beam and fasten to brackets with ½" Type S-12 Screws.

Attach (two) (three) layers of 5%" SHEETROCK Brand FIRECODE Gypsum Panels to channel brackets with screws. Install vertical panels first, with bottom panels overlapping lower edges of panels in each layer. Attach panels to channel brackets with (1") (11¼") Type S Screws 16" o.c. for base layer, 15%" Type S Screws 12" o.c. for middle layer and (17%") (21¼") Type S Screws 8" o.c. for face layer. For 3-hour assembly, install wire mesh over bottom middle layer panel, extend 1½" up each side and fasten with 15%" screws used to fasten panels.

3.6 column fireproofing installation

3.6.1 UL Design X518-2 hr.

Attach inner layer ½" SHEETROCK Brand FIRECODE "C" Panels to 15½" steel studs with 1" Type S Screws spaced 24" o.c. and place assembly with gypsum panel next to column flange. Install gypsum panel layer vertically around column using 1" Type S Screws to attach base layer to stud web 24" o.c. and face layer to stud flange 12" o.c. Apply face layer vertically over web face side of column and fasten through base layer to web of studs with 15/16" Type S Screws spaced 12" o.c. and staggered from screws in base layer. Apply corner bead at all corners, fasten with 1" Type S Screws 9" o.c and finish with joint compound.

3.6.2 UL Designs X521-2 hr. & X514-3 hr.

For all W14 x 228 steel columns, provide fire protection with ½" SHEETROCK Brand FIRECODE "C" Panels applied vertically over 15%" steel studs positioned at corners. Attach panels to studs with 1" Type S Screws spaced 12" o.c. For 3-hour rating install additional layer over web surface and attach to studs with 15%" Type S Screws spaced 12" o.c. Apply corner bead at all corners and finish with joint compound.

3.6.3 UL Design X515-3 hr.

Attach inner layer ½" SHEETROCK Brand FIRECODE "C" Panels to 15%" steel studs with 1" Type S Screws spaced 12" o.c. and place assembly with gypsum panel next to column flange. Install two additional layers to stud flange and three additional layers to stud web over web face side of column. Fasten base layers with 1" Type S Screws, middle layers with 15%" screws and face layers with 2½" screws. Space all screws 12" o.c. vertically. Apply corner bead at corners; finish with joint compound.

3.6.4 UL Design X507-4 hr.

For all W14 x 228 steel columns, provide fire protection with double-layer ½" SHEETROCK Brand FIRECODE "C" Panels applied vertically over 15%" steel studs positioned at corners. Attach base layer to studs with 1" Type S Screws spaced 12" o.c. and attach face layer with 15%" Type S Screws spaced 12" o.c. and staggered 6" from base layer screws. Apply corner bead at corners; finish with joint compound.

3.6.5 UL Design X524-2 hr.

studs to runners at top and bottom with 1/2" Type S-12 Pan Head

Screws. Apply gypsum panels horizontally and stagger joints between

Attach inner layer of gypsum panels to 15%" steel studs with 1" Type S Screws spaced 12" o.c. and place assembly with gypsum panel next to column flange. Install two additional layers to stud flange and three additional layers to stud web over web face side of column. Fasten inner layers with 1" Type S screws, middle layers with 15%" Type S Screws, and face layers with 21/4" Type S Screws. Space all screws 12" o.c. and stagger in adjacent layers.

3.7 wall furring installation

3.7.1 direct furring channel attachment

Attach metal furring channels (vertically) (horizontally), spaced 24" o.c., to interior of masonry or concrete surfaces with hammer-set or power-driven fasteners or concrete stub nails staggered 24" o.c. on opposite flanges. Nest channels 8" at splices and anchor with two fasteners in each wing. Where furring channel is installed directly to exterior wall and a possibility of water penetration through walls exists, install asphalt felt protection strip between furring channel and wall.

Apply gypsum panels (parallel to channels) (perpendicular to channels). Position all edges over furring channels in parallel application; all ends over framing in perpendicular application with joints staggered in successive courses. Use maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together. Fasten panels to channels with 1" Type S Screws spaced 16" o.c.

3.7.2 mechanical application—Z-furring channels

Erect insulation vertically and hold in place with Z-furring channels spaced 24" o.c. Except at exterior corners, attach narrow flanges of furring channels to wall with concrete stub nails or power-driven fasteners spaced 24" o.c. At exterior corners, attach wide flange of furring channel to wall with short flange extending beyond corner. On adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with a standard width insulation panel and continue in regular manner. At interior corners, space second channel no more than 12" from corner and cut insulation to fit. Hold mineral-fiber insulation in place until gypsum panels are installed with 10" long staple field-fabricated from 18-ga. tie wire and inserted through slot in channel. Apply wood blocking around window and door openings and as required for attachment and support of fixtures and furnishings.

Apply gypsum panels parallel to channels with vertical joints occurring over channels. Use no end joints in single-layer application. Attach gypsum panels with 1" Type S Screws spaced 16" o.c. in field of panels and at edges, and with 11/4" Type S Screws spaced 12" o.c. at exterior corners. For double-layer application, apply base layer parallel to channels, face layer either perpendicular or parallel to channels with vertical joints offset at least one channel. Attach base layer with screws 24" o.c. and face layer with 15%" screws 16" o.c.

3.8 accessory application

- a. Joint System—Finish all face panel joints and internal angles with a U.S.G. Joint System installed according to manufacturer's directions. Spot exposed fasteners on face layers and finish corner bead, control joints and trim as required, with at least three coats of joint compound, feathered out onto panel faces and sanded smooth.
- b. Laminating Adhesive—Spread to provide 1/2" adhesive beads 41/2" o.c. for full sheet lamination. For strip lamination, apply adhesive in vertical strips of four 1/2" beads 11/2" to 2" o.c. Space strips 24" o.c.
- c. Corner Bead-Reinforce all vertical and horizontal exterior corners with corner bead fastened with 9/16" galvanized staples 9" o.c. on both flanges along entire length of bead.
- d. Metal Trim-Where assembly terminates against masonry or other dissimilar material, apply metal trim over panel edge and fasten with 9/16" galvanized staples 9" o.c.
- e. P-1 Vinyl Trim—Slip trim over panel with long flange behind panel. Install panel with trim firmly abutting surface.
- f. Screws-Power-drive at least 3/8" from edges or ends of panel to provide uniform dimple 1/32" deep.
- g. Control Joints-Break panel behind joint and back by double framing members (and 2" wide gypsum panel strip). Attach control joint to face layer with 9/16" galvanized staples spaced 6" o.c. on both flanges along entire length of joint.

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Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

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UNITED

lightweight, quickly erected, fire-rated walls and ceilings with excellent sound attenuation

These basic gypsum drywall assemblies offer economical, quickly erected, load-bearing partitions, walls and ceilings wherever fire protection is desired with wood framing. Excellent sound attenuation at low cost is provided when gypsum panels are resiliently attached. The assemblies are likewise suitable for wall furring and exterior soffit applications. Also designed for wood-frame construction are USG Area Separation Walls, fire-rated gypsum drywall assemblies for multi-family housing (see separate System Folder SA-925). Variations of the systems meeting special requirements are outlined below:

Single layer—a basic drywall load-bearing construction suitable where SHEETROCK Brand Gypsum Panels are applied direct to wood framing—either with long edges parallel to framing, or horizontally with long edges at right angles to framing members. Perpendicular application, recommended except in certain fire-rated partition construction or for predecorated panels, provides greater strength, reduces joint treatment and blocking needed, compensates for uneven framing alignment. Fastening of panels is by four alternate methods:

- 1. Standard single nailing—6" to 7" c. to c. spacing for ceilings, 7" to 8" for walls.
- 2. Double nailing—for minimizing defects due to loosely nailed panels. First nails spaced 12" o.c, followed by second nails in close proximity (2") of first.
- 3. Screw application—best known insurance against fastener pops caused by loosely attached panels. 11/4" USG Type W Screw is used.
- 4. Adhesive application—continuous bead of drywall stud adhesive applied to framing plus supplementary nailing; improves bond strength by 50% to 100%, greatly reduces face nailing needed. When vinyl foam tape is used on sidewalls with drywall stud adhesive, supplementary fasteners are unnecessary.

Two other proven methods upgrade job quality:

Back-Blocking Joint Reinforcement—a method designed to minimize an inherent joint deformation ("ridging") that may occur with adverse job and weather conditions.

Floating Interior Angle System—application of panels to effectively reduce nail pops and angle cracking which may result from stresses at intersections of walls and ceilings.

Double Layer—systems have a face layer of SHEETROCK Brand Gypsum Panels job-laminated and/or nailed to base layer of gypsum panels and directly attached to wood framing in walls and ceilings. Because these laminated systems minimize the use of mechanical fasteners in the face layer, finer appearance results—along with greater strength, fire and sound resistance. Adhesive lamination of face layer to base layer, when both are gypsum panels, is by either of

two methods: (a) strip lamination—a DURABOND Joint Compound or USG Ready-Mixed Joint Compound—Taping or All Purpose applied in vertical strips 24" o.c. and supplementary 11/2" USG Type G Screws, or (b) sheet lamination—adhesive applied over the entire panel surface with supplementary Type G Screws or temporary supports until adhesive dries.

When a fire rating is not required, contact bonding of face layer with adhesive is preferred. Either laminating adhesive (notched-spreader applied) or liquid contact adhesive (roller-applied) is used with fasteners 16" o.c. at top and bottom of wall panels and perimeter fasteners 24" o.c. on ceilings.

These assemblies are completed with a U.S.G. joint treatment system and decorating—both steps unnecessary in walls, however, when predecorated vinyl-surfaced Textone Gypsum Panels are adhesively applied (see folder SA-928).

Three alternate framing methods with wood stude spaced 16" o.c. provide load-bearing assemblies developed to meet fire resistance and sound control requirements in partitions:

- 1. Conventional 2x4 stud construction, two layers %" SHEETROCK Brand FIRECODE Gypsum Panels, or ½"SHEETROCK Brand FIRECODE "C" Panels over base layer of ¼" regular gypsum panels. These offer higher sound and/or fire ratings than did the original double wall assembly employing two layers of %" regular panels.
- 2. Double row of 2x3 staggered studs set on separate plates 1" apart, with single layer of 5%" SHEETROCK Brand FIRECODE Panels and 3" THERMAFIBER Sound Attenuation Blankets in the cavity. This provides sound isolation of 54 STC where one-hour fire resistance rating (load bearing) is required. With 2x4 staggered studs on a common 2x6 plate and double layer 5%" SHEETROCK Brand FIRECODE "C" Panels, 2-hour fire resistance rating is obtained.
- 3. Double row of 2x4 studs set on separate plates 1" apart and double layer %" SHEETROCK Brand FIRECODE "C" Panels offer sound isolation of 51 STC, 2-hour fire resistance and chase space required for party walls in garden apartments. With 3½" blankets in one cavity, sound attenuation increases to 56 STC.

Resilient Attachment—SHEETROCK Brand Panels are screw-attached to RC-1 Resilient Channels which are also screw-attached 24" o.c. to the framing. The galvanized steel channels "float" the panels away from the framing; provide a spring action that isolates the gypsum panel surface. These systems combine highly effective sound isolation with lightweight low-cost construction.

An excellent value in wood frame party walls consists of single-layer %" SHEETROCK Brand FIRECODE "C" Panels, resiliently attached to one side of studs and directly attached to the other side, plus 3"



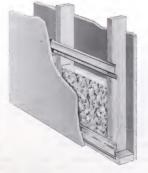


(continued on page 3)

single-layer staggered stud partition



double-layer partition



single-layer resilient partition



double-layer resilient partition

single-layer resilient ceiling

test data/partitions and walls

partition applications

fire	fire-rated construction	acoustic	cal performance	
rating	description & test no.	STC	description & test no.	
45 min.	Wd Stud—½" SHEETROCK brand FIRECODE "C" gypsum panels—2x4 16" o.c.—panels nailed 7" o.c.—1%" cem ctd nails—joints fin— UL Des U317 wt 6 width 4%"	N/A		A
1 hr.	Wd Stud—Resil %" SHEETROCK brand FIRECODE "C" gypsum panels—2x4 16" or 24" o.c. —3" THERMAFIBER sound atten blkts—RC-1 chan one side spaced 24" o.c.— panels att with 1" Type S screws—opp side direct at with 11/4" Type W screws—joints fin— perimeter caulked— UL Des 311 wt 7 width 5%"	50	BBN-760903	E
1 hr.	Wd Stud—Resil %" SHEETROCK brand FIRECODE gypsum panels—2x4 16" o.c.— RC/1 chan both sides spaced horiz 24" o.c. att with 6d nails—panels att with 1" Type S screws— joints fin—perimeter caulked— TL-1396-OSU wt 7 width 5%"	45†	TL-60-52	C
1 hr.	Wd Stud—5%" SHEETROCK brand FIRECODE or W/R FIRECODE "C" gypsum panels —2x4 16" or 24" o.c.—panels nailed 7" o.c.—17%" cem ctd nails—joints fin—perim caulked —UL Des U305 based on 16" stud spacing—UL Des U314 based on 24" stud spacing wt 7 width 4%"	46 34†	Based on 24" stud spacing and screws 12'o.c.; includes 3' sound atten. blanket—BBN-700725 Based on 16" stud spacing and screws 16" o.cUSG-30-FT-G&H	
1 hr. est	Stag Wd Stud—56" SHEETROCK brand FIRECODE gypsum panels—2x3 16" o.c. —2x3 plates 1" apart—panels nailed 7" o.c. —3" THERMAFIBER sound atten blkts one side— joints fin—perim caulked—est. fire rating based on UL Des U305 wt 8 width 7½"	54	Based on screws or nails 7" o.c.— TL-77-149	E
1 hr. est	Wd Stud—1/2" SHEETROCK brand FIRECODE "C" gypsum panels—2x4 16" o.c.—2 layer	45	TL-69-52	F
	—base layer ¼" SHEETROCK brand gypsum panels appl vert with 4d ctd nails—½" panel face layer strip lamin—joints stag & fin—perimeter caulked—est. fire rating based on UL Des U305 wt 8 width 5\%"	53	Based on %" lamin. face layers & 11/2" sound atten. blankets—USG-221-ST-G&H	
1 hr. est	Stag Wd Stud—5%" SHEETROCK brand FIRECODE "C" gypsum panels—2x4 16" o.c. on 2x6 com plate—panels att with 6d ctd nails 7" o.c.—2" THERMAFIBER sound atten bikts one side—perim caulked—joints fin—est. fire rating based on UL Des U305 wt 8 width 6%"	45	TL-69-213	C
1 hr.	Wd Stud—2 layers ¾" SHEETROCK brand gypsum panels lamin & nailed—2x4 16" o.c. —joints fin— T-118-48-OSU wt 7 width 5\%"	38†	TL-57-14	ŀ
1 hr. est	Wd Stud—2 layers ½" SHEETROCK brand FIRECODE "C" gypsum panels ea side— 2x4 16" o.c.—3" THERMAFIBER sound atten blkts—RC-1 chan one side spaced 24" o.c.—resil side	59	TL-67-239	
	screw att—opp side nail att—both base layers appl vert and face layers appl horiz—base layers perim caulked—joints fin—est. fire rating based on UL Des U311 wt 12 width 61/8"	49	Based on same construction without blankets—TL-67-212	
2 hr.	Wd Stud—2 layers %" SHEETROCK brand FIRECODE "C" gypsum panels ea side—2x4 16" o.c.—2" THERMAFIBER sound atten blkts—RC-1 chan one side spaced 24" o.c.—resil side screw att—opp side nail att—both base layers appl vert and face layers appl horiz—base layers perim caulked—joints fin— T-4799-OSU wt 13 width 6%"	58 52	USG-810219 Based on same assembly (non-fire rated) without blankets —USG-810218	
2 hr.	Wd Stud—2 layers %" SHEETROCK brand FIRECODE or W/R FIRECODE "C" gypsum panels ea side—2x4 16" o.c.—base layer att with 6d nails 6" o.c.—face layer lamin or nailed to base—joints fin— UL Des U301 wt 12 width 6\%"	N/A		H
2 hr. est	Wd Stud—2 layers %" SHEETROCK brand FIRECODE "C" gypsum panels —2 rows 2x4	51	TL-69-214	ı
	16" o.c. on sep plates 1" apart—base layer att with 6d ctd nails 16" o.c.—face layer att with 7d ctd nails 7" o.c.—perim caulked—joints fin—est. fire rating based on UL Des U301 wt 13 width 1034"	56	Based on 31/2" thick blankets in one cavity—USG-710120	
2 hr. est	Stag Wd Stud—2 layer %" SHEETROCK brand FIRECODE "C" gypsum panels—2x4 16" o.c. on 2x6 com plate—base layer att with 6d ctd nails 6" o.c.—face layer att with 8d ctd nails 8" o.c.—perim caulked—joints fin—est. fire rating base on UL Des U301 wt 13 width 8\%"	47	TL-69-211	٨
Note: Partition	on width based on 3%" stud width.	tBased	on 11-freg.	_

wall furring applications

description	comments	
Z-Furring Channels 24" o.c.—THERMAFIBER Z-Furring Insulation between channels— ½" Foil-Back SHEETROCK brand gypsum panels screw attached—joints finished	System suitable for up to 3" thick insulation; good vapor retarder; no limiting height	N
Wood furring strips 16" o.c.—1/2" Foil-Back SHEETROCK brand gypsum panels—joints finished	Surface not isolated from structural stresses	0

For ceiling applications, see page 6.

exterior wall applications

fire	fire-rated construction	
rating	description & test no.	
1 hr.	Wd Stud—%" SHEETROCK brand FIRECODE gypsum panel interior—1/2" gypsum sheathing and %" min shingle exterior—2x4 16" o.c.—3" glass fiber insul blkts—sheathing appl horiz with 6d nails 8" o.c.—gypsum panels appl vert with 6d nails 7" o.c.—joints fin— UL Des U014	P
1 hr.	Wd Stud—%" SHEETROCK brand FIRECODE "C" gypsum panel interior—1" FOAMULAR polystyrene insul sheathing and ½" plywd siding—2x4 16" o.c.—3½" THERMAFIBER W-S blkts—sheathing appl horiz with 1½" galv nails 12"—c gypsum panels appl vert with 6d cem ctd nails 7" o.c.—joints fin—CEG 12-5-79	Q
2 hr.	Wd Stud—2 layers %" SHEETROCK brand FIRECODE gypsum panel interior—½" gypsum sheathing and 4" brick masonry veneer exterior—2x4 16" o.c.—sheathing appl horiz with 11d galv nails 6" o.c. —gypsum panels appl horiz or vert with nails 8" o.c.—joints stag & fin— UL Des U302 †	R

†Fire rating also applies with IMPERIAL FIRECODE "C" Base and veneer finish interior surface.

description/technical data

(continued from page 1)

THERMAFIBER Sound Attenuation Blankets pressed tightly into the stud cavity. This lightweight partition is widely used for its high sound value, STC 50, at costs which are little more than for conventional partition systems. It also offers 1-hour rated fire resistance; often chosen for use between units in garden apartments.

Where exceptional sound control, greater fire resistance and strength are required, double-layer drywall construction is used with THERMAFIBER Blankets and RC-1 Channels applied one side of wood studs (see table, page 2).

Area Separation Walls—fast-erecting non-load bearing drywall partitions for low-cost fire barriers in wood-frame multi-family housing (see separate Systems Folder SA-925).

Wall Furring—Foil-Back Sheetrock Brand Panels provide an economical, efficient vapor retarder and a readily decorated interior surface for exterior walls. Panels are attached to wood furring strips 16" o.c. or screw-attached to Z-Furring Channels 24" o.c. The channels mechanically attach Thermafiber Z-Furring Blankets or rigid foam insulation to the interior of exterior walls. The system provides a self-furring solid backup for Foil-Back Panels, screw attached to the channels.

Gypsum panels for these assemblies are available in five thicknesses and nine types. Sheetrock Brand Firecode Panels, with a specially formulated core, obtain higher fire-resistance ratings than regular panels. Sheetrock Brand W/R (water-resistant) Panels are an ideal tile base for tub and shower areas. Exterior Gypsum Ceiling Board offers superior weather-and-sag-resistance plus excellent paintability in exterior soffits.

Gypsum panels are easily screw-applied to channel-type galvanized steel studs. See U.S.G. folders for details: SA-923 on nonload bearing assemblies and SA-510 on load-bearing construction.

limitations

- 1. USG Type S Screws must be used for attachment of single-layer panels to RC-1 Resilient Channels.
- 2. RC-1 Resilient Channels must be attached to bottom of wood floor joists with 11/4" USG Type W or 1" Type S Screws. Nails must not be used. For fire-rated construction, use 11/4" Screws, Type S or W.
- 3. Resilient ceilings should not be installed beneath highly flexible floor joists. Install only to framing meeting "Wood Framing Require-

ments" shown in U.S.G. Gypsum Panels Product Folder SA-927.

- **4.** Direct attachment to wood framing with fastener penetration into wood exceeding 1" is not recommended except where required to meet fire rating.
- **5.** Maximum resilient channel spacing: ceilings—24" o.c. for joists 16" o.c.; 16" o.c. for joists 24" o.c. Sidewalls—24" o.c. Also see panel frame spacing limitations below.
- 6. SHEETROCK Brand Panels should not be exposed to excessive or continuous moisture and extreme temperature. Specially formulated SHEETROCK Brand W/R Panels are recommended as a base for wall tile in bathrooms and other high moisture areas.
- 7. Maximum frame spacing for gypsum panels:

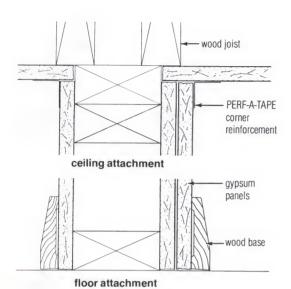
panei thickness	location	application method (1)	max. frai	
Single-Layer App	lication		in	mm
3/8"	ceilings(2)	perpendicular(3)	16	406
(9.5 mm)	sidewalls parallel or perpendice		16	406
		parallel(3)	16	406
½" (12.7 mm)	ceilings	perpendicular	24(4)	610
12.7 11111)	sidewalls	parallel or perpendicular	24	610
		parallel(3)		406
%" (15.9 mm)	ceilings	perpendicular	24	610
(10.5 11111)	sidewalls	parallel or perpendicular	24	610
Double-Layer App	olication			
3/6"	ceilings(5)	perpendicular	16	406
(9.5 mm)	sidewalls	perpendicular or parallel	24(6)	610
1/2" & 5/8"	ceilings	perpendicular or parallel	24(6)	610
(12.7 & 15.9 mm)	sidewalls	perpendicular	24(6)	610

- (1) Long edge position relative to framing. (2) Not recommended below unheated spaces. (3) Not recommended if water-based texturing material is to be applied. (4) Max. spacing 16" if water-based texturing material to be applied. (5) Adhesive must be used to laminate % board for double-layer ceiling construction. (6) Max. spacing 16" o.c. if fire rating required.
- 8. These assemblies are not recommended for exterior soffits and ceilings which project upwards and away from the building proper.

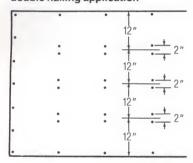
sound transmission loss—db

		band	center fi	requenc	y—Hz													
test no.	method	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	STC
TL-67-239	Lab	35	41	47	53	56	57	59	60	61	63	64	65	65	64	59	61	59
USG-810219	Lab	39	42	48	51	53	56	57	57	60	60	60	62	57	58	59	61	58
USG-710120	Field	43	40	46	49	48	49	51	54	56	59	60	64	66	66	65	71	56
TL-77-149	Lab	31	38	39	45	-50	52	55	57	57	57	59	58	57	55	55	57	54
USG-221-ST-G&H	Lab	30	37	42	47	48	48	48	51	55	57	58	59	59	57	59	62	53
USG-810218	Lab	38	31	38	45	49	53	52	54	56	57	58	59	53	55	58	62	52
TL-69-214	Lab	31	35	34	39	44	48	51	53	56	56	59	57	50	53	59	59	51
BBN-760903	Lab	26	30	36	42	45	47	50	55	56	57	57	57	55	51	54	58	50
TL-67-212	Lab	26	30	33	39	42	47	49	52	55	57	60	61	61	58	53	56	49
TL-69-211	Lab	30	33	35	40	40	42	44	46	49	51	52	52	48	48	53	57	47
BBN-700725	Lab	31	31	36	38	39	41	42	46	49	51	52	54	49	45	48	52	46
TL-69-52	Lab	21	28	34	35	39	41	41	46	49	51	54	56	55	53	52	55	45
TL-69-213	Lab	25	31	35	37	41	40	40	43	46	46	51	51	47	47	51	54	45

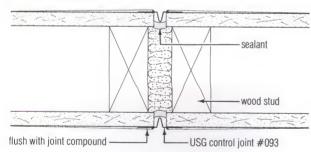
details/partitions



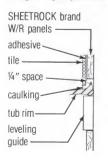
double nailing application



wall control joint



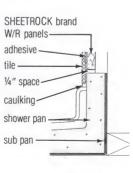
tub and shower details—SHEETROCK Brand W/R Panels single-layer panels



tub

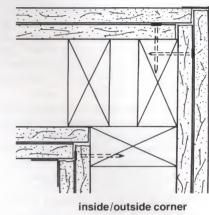
SHEETROCK brand W/R panels adhesive tile -1/4" space. caulking furring as req'd

shower receptor



shower pan

corner framing details



sealant-see sound-isolating partition notes to architect test TL-69-52: 45 STC

1/2" SHEETROCK brand

FIRECODE "C"

gypsum panels

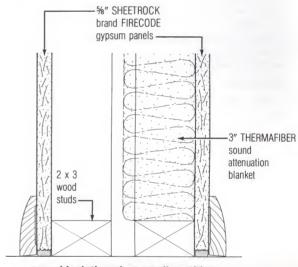
2 x 4

wood

stud

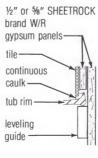
1/4" SHEETROCK

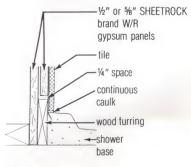
brand gypsum panels-



sound-isolating chase wall partition test TL-77-149: 54 STC

double-layer panels



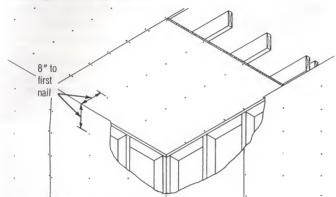


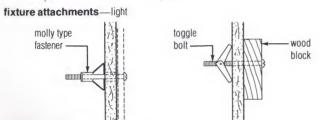
tub shower receptor

4

details/partitions

floating interior angle system



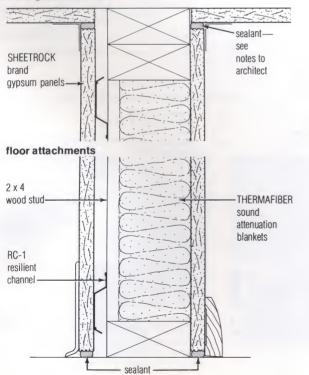


fastener load data

fastener	size		base		. withdrawal	allow. shear resistance		
type	in	mm	assembly	lb	N (1)	lb	N (1)	
molly or	1/8	3.18	½" gypsum	20	89	40	178	
toggle	3/16	4.76	panel	30	133	50	222	
bolt	1/4	6.35	·	40	178	60	267	

(1) Newtons

ceiling attachments

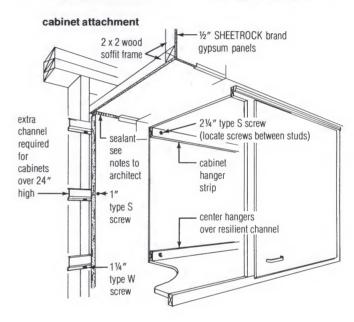


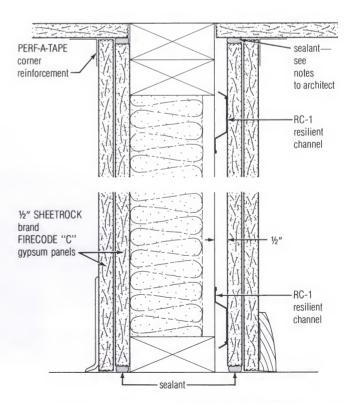




sheet lamination

strip lamination





test data/ceilings

fire	fire-rated construction	acous	tical pe	rformance	
rating	description & test no.	STC	IIC	description & test no.	
l hr.	1/2" SHEETROCK brand FIRECODE "C" gypsum panel ceiling—1" nom wd sub & fin flr— 2 x 10 wd joist 16" o.c.—panels att with 5d cem ctd nails 6" o.c.—joists fin— UL Des L512 clg wt. 3	N/A			,
1 hr.	Resil ½" SHEETROCK brand FIRECODE "C" gypsum panel ceiling—1" nom wd sub & fin fir —2 x 10 wd joist 16" o.c.—RC-1 chan spaced 24" o.c.—panels att with 1" Type S screws—joints fin— UL Des L514 clg wt 3	N/A			E
l hr.	Resil %" SHEETROCK brand FIRECODE "C" gypsum panel ceiling—1%" perlite-sand conc over %" plywd sub-floor—2 x 10 wd joist 16" o.c.—3" glass fiber batts betw joists— RC-1 chan screw att to joists—panels att with 1" Type S screws—joints fin— UL Des L516 clg wt 3	N/A			(
I hr. est	Resil SHEETROCK brand gypsum panel ceiling—11/4" nom wd sub & fin flr—2 x 10 wd joist 16" o.c.—RC-1 chan screw att to joists—panels att with 1" Type S screws—joints fin—est. fire rating based on UL Des 514 clg wt 3	47 47	39 39	Based on ½" FIRECODE "C" panels—CK-6512-6 Based on %" reg gypsum panels—CK-6412-10	С
1 hr. est	Resil SHEETROCK brand gypsum panel ceiling—11/4" nom wd sub & fin fir—44-oz carpet & 40-oz pad atop fir—2 x 10 wd joist 16" o.c.—RC-1 chan screw att to joists—panels att with 1" Type S screws—joints fin—est. fire rating based on UL Des L514 clg wt 3	47 48	67 66	Based on 1/2" FIRECODE "C" panels—CK-6512-7 Based on 5/6" reg gypsum panels—CK-6412-9	E
1 hr. est	Resil SHEETROCK brand gypsum panel ceiling—1¼" nom wd sub & fin fir—2 x 10 wd joist 16" o.c.—3" THERMAFIBER sound atten blkts betw joists—RC-1 chan screw att to joists—panels att with 1" Type S screws—joints fin—est. fire rating based on UL Des L514 clg wt 3	51 50	46 46	Based on ½" FIRECODE "C" panels CK-6512-9 Based on 5/" reg gypsum panels— CK-6412-3	F
1 hr. est	Resil SHEETROCK brand gypsum panel ceiling—11/4" nom wd sub & fin flr—44-oz carpet & 40-oz pad atop flr—2 x 10 wd joist 16" o.c.—3" THERMAFIBER sound atten blkts betw joists—RC-1 chan screw att to joists—panels att with 1" Type S screws—joints fin—est. fire rating based on UL Des L514 clg wt 3	52 51	71 70	Based on ½" FIRECODE "C" panels—CK-6512-8 Based on 5%" reg gypsum panels—CK-6412-4	G
1 hr.	%" SHEETROCK brand FIRECODE gypsum panel ceiling—Amer Plywood Assn 2-4 1 flr 4 x 10 wd joist 48" o.c.—USG met fur chan spaced 24" o.c.—panels att with 1" Type S screws—joints fin— UL Des L508 clg wt 3	N/A			ŀ
1 hr.	5%" SHEETROCK brand FIRECODE gypsum panel ceiling—1" nom wd sub & fin ffr—2 x 10 wd joist 16" o.c.—panels att with 6d nails 6" o.c.—joints fin— UL Des L501 clg wt 3	38 39	32 56	CK-6412-7 Based on 44-oz carpet & 40-oz pad atop flooring—CK-6412-8	
1 hr. est	%" SHEETROCK brand gypsum panel ceiling—1" nom wd sub & fin flr—2 x 10 wd joist 16" o.c.—3" THERMAFIBER sound atten blkts betw joists—panels att with 6d nails 6" o.c.— joints fin—est. fire rating based on UL Des L501	41 40	32 58	CK-6412-6 Based on 44-oz carpet & 40-oz pad atop flooring—CK-6412-5	
1 hr.	½" SHEETROCK brand FIRECODE "C" gypsum panel ceiling—1" nom wd sub & fin flr—2 x 10 wd joist 16" o.c.—susp grid with main run 4' o.c. and cross tees 2' o.c.—panels screw-att below grid—joint fin—UL Des L525 clg wt 3	N/A			
1 hr.	5% SHEETROCK brand FIRECODE "C" gypsum panel ceiling—2x12 wd truss of 2x4 lbr secured with steel truss plates—trusses 24" o.c.—34" nom plywd flr—USG met fur chan 24" o.c. wiretied to trusses—panels att with 1" type S screws 12" o.c.—joints fin— UL Des L528 clg wt 3	N/A			
1 hr.	5%" SHEETROCK brand FIRECODE "C" gypsum panel ceiling—2x12 wd truss of 2x4 lbr secured with steel truss plates—trusses 24" o.c.—34" nom plywd flr—USG susp grid with main run 4' o.c. and cross tees 2' o.c.—panels att with 1" type S-12 screws 12" o.c.—joints fin— UL Des L529 clg wt 3	N/A			٨
1 hr.	1/2" SHEETROCK brand FIRECODE "C" gypsum panel ceiling—3/4" T&G plywd flr—10" I-shaped wd joist 24" o.c.—USG met fur chan 24" o.c. clip-att to joist—1" THERMAFIBER insul laid over chan below joists—panels screw att to chan 12" o.c.—joints fin— UL Des L530 clg wt 3	47	40 54 43	TL-81-87—TL-81-16 Based on carpet & pad atop flooring—TL-81-17 Based on cushioned vinyl atop flooring—TL-81-19	1
1½ hr.	Resil 2 layers ½" SHEETROCK brand FIRECODE "C" gypsum panel ceiling—1" nom wd sub & fin flr—2 x 10 wd joist 16" o.c.—RC-1 chan spaced 24" o.c. screw-att over base layer panels—face layer screw att to chan 12" o.c.—joints fin— UL Des L510 clg wt 4	N/A	٠		(
2 hr.	Resil 2 layers %" SHEETROCK brand FIRECODE "C" gypsum panel ceiling—1" nom wd sub & fin flr—2 x 10 wd joist 16" o.c.—RC-1 chan spaced 24" o.c. screw att over base layer panels—face layer screw att to chan 12" o.c.—joints fin—UL Des L511 clg wt 5	N/A			

singlelayer celling



doublelayer celling



resilient channel with blankets



description/ceilings

In single-layer ceiling assemblies, SHEETROCK Brand Gypsum Panels are applied across the supports and fastened with nails or screws. Nails are spaced 6" to 7" o.c. (6" for fire-rated construction); 11/4" USG Type W Screws are spaced 12" o.c. Where no fire rating is required, adhesive nail-on fastening improves bond strength and reduces face nailing.

Resilient channel systems offer fire-resistant wood joist floor/ceiling assemblies having highly efficient sound isolation at low cost—qualities particularly needed in apartments, motels and other multifamily buildings. RC-1 Resilient Channels are screw-attached across wood joists; gypsum panels are attached to channels with USG Type S Screws. A one-hour fire rating is available with ½" SHEETROCK Brand FIRECODE "C" Panels. With a double-layer 5%" SHEETROCK Brand FIRECODE "C" Panels separated by RC-1 Resilient Channels, a 2-hour rating is provided. When 3" THERMAFIBER Sound Attenuation Blankets are installed between joists, airborne and impact sound ratings are greatly improved (see table, left.).

When additional ceiling space is needed to accommodate large ducts or pipes, gypsum panels are screw-attached below the USG Direct Suspension System. This direct-hung steel ceiling grid consists of main beam runners 4 ft. o.c. and cross furring channels spaced 24" o.c. A cross beam supports the edge of lighting fixtures. With 1½" or 5½" SHEETROCK Brand FIRECODE "C" Panels screw-attached to this grid, a one-hour fire-rated wood joist floor/ceiling is provided. The assembly includes provision for lighting fixtures, air ducts and dampers.

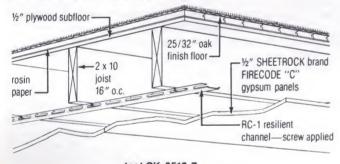
Gypsum panels are easily screw-applied to channel-type USG Steel Joists. See U.S.G. Folder SA-510 for details.



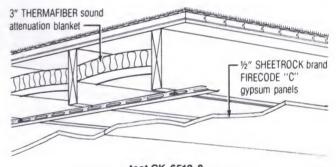
resilient ceiling application

Exterior Soffits—eaves, canopies and carports and other exterior soffit applications with indirect exposure to the weather are quickly and economically completed with USG Exterior Gypsum Ceiling Board fastened directly to joists (see U.S.G. Bulletin WB-1152 for detailed specification). Maximum frame spacing and other limitations for these systems are shown on page 3.

ceiling and floor assemblies



test CK-6512-7 test CK-6512-6—same but without carpet & pad



test CK-6512-8 test CK-6512-9—same but without carpet & pad

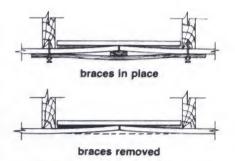
back-blocking procedure



A. Gypsum panels are applied with long edges at right angles to joists. Backing blocks 8" wide, cut from scrap panels, are cemented and placed along full length of edge and ends of panels. Floating of end joints compensates for a twisted stud or joist.

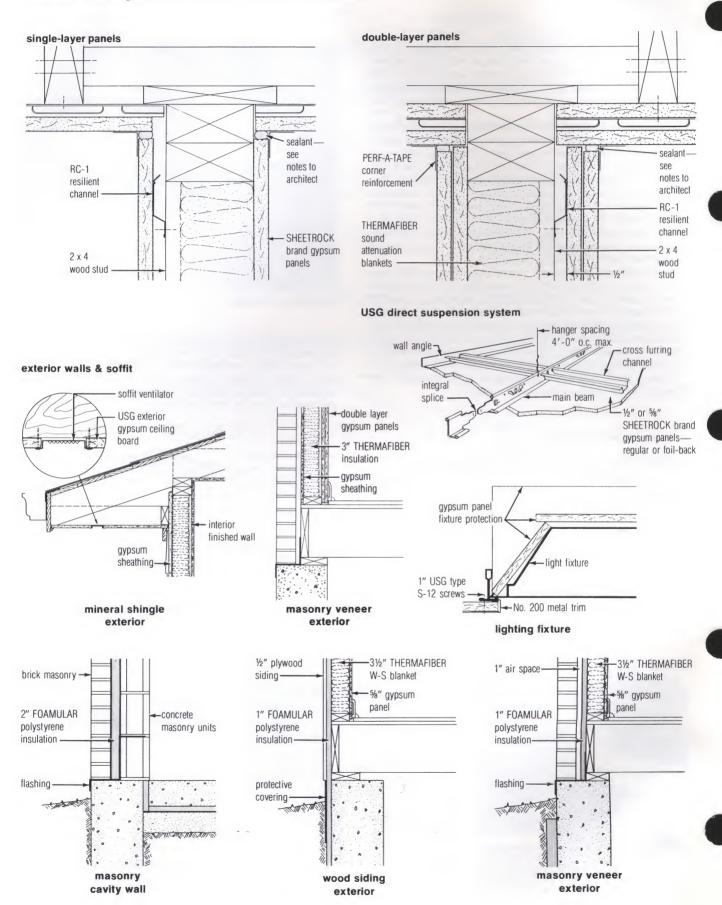


B. Immediately after all blocks are in place, the next panel, which had been previously cut, is erected. Ends are loosely butted.



C. Cross section shows how floated end joint is tapered and back-blocked. Brace is temporarily nailed over wood strip (top drawing) which depresses ends of panels. With strips removed, tapered formation remains as shown at bottom.

details/ceilings



specifications

notes to architect

- 1. System Performance—U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.
- 2. Control Joints—Gypsum panel surfaces should be isolated with control joints or other stress relief where: (a) partition or furring abuts a structural element (except floor) or dissimilar wall or ceiling; (b) ceiling abuts a structural elements, dissimilar wall or partition or other vertical penetration; (c) construction changes within the plane of the partition or ceiling (d) partition or furring run exceeds 30'; (e) ceiling dimensions exceed 50' in either direction with perimeter relief, 30' without relief; (f) exterior soffits exceed 30' in either direction; (g) wings of "L", "U" and "T'-shaped ceiling areas are joined; (h) expansion or control joints occur in the base exterior wall. Ceiling-height door frames may be used as control joints. Less-than-ceiling height frames should have control joints extending to the ceiling from both corners. If control joints are not used, additional reinforcement is required at corners to distribute concentrated stresses.

Gypsum panel surfaces should not be firmly anchored across the flat grain of wide dimensional lumber such as floor joists and headers. Float panels over these members using resilient channels or provide a control joint to counteract wood shrinkage.

- 3. Penetrations of the gypsum panel diaphragm, such as borrowed lights, access panels, light troffers, require additional reinforcement at corners to distribute concentrated stress if a control joint is not used.
- 4. Sound tests are conducted under ideal laboratory conditions per ASTM procedures. Comparable field performance depends on building design and careful attention to detailing and workmanship. Where these partitions are used for sound control, USG Acoustical Sealant is recommended to seal the partition perimeter and all cut-outs such as electrical boxes. Back-to-back penetrations of the diaphragm, flanking paths, door and borrowedlight openings should be avoided. Exterior wall surfaces should be resiliently mounted to minimize flanking paths between floor and ceiling construction.
- 5. TEXTONE Vinyl-faced Panels—For adhesive applications only water-based adhesives are recommended; other adhesives may not be compatible with the vinyl surface.
- 6. Ceramic Tile—SHEETROCK Brand W/R Gypsum Panels are recommended as a base for adhesive application of ceramic and plastic tile and plastic-faced wall panels. A vapor retarder is not recommended.
- 7. Wood Framing Requirements—Wood framing meeting the minimum requirements of HUD/FHA, American Softwood Lumber Standard and local building codes is necessary for proper performance.
- 8. Ceilings—To prevent objectionable sag in new gypsum panel ceilings, the weight of overlaid unsupported insulation should not exceed 1.3 psf for $\frac{1}{2}$ " thick panels with frame spacing $\frac{2}{4}$ " o.c.; $\frac{2}{2}$ psf for $\frac{1}{2}$ " panels on 16" o.c. framing and $\frac{5}{6}$ " panels on 24" o.c. framing. Foil-back panels or a separate vapor retarder should be installed in all exterior ceilings, and the plenum or attic space vented with a min. $\frac{1}{2}$ -sq. in. net free vent area per sq. ft. of horizontal surface. In winter or cold climates, a polyethylene vapor retarder should not be used unless the insulation is installed prior to ceiling panels.

Water-based texturing materials applied to ceilings should be completely dry before insulation and vapor retarder are installed. Under most conditions, drying takes several days; i. e., 10% r. h. and 90°F. conditions require 1.5 days; 90% r. h. and 90°F. conditions, 10.5 days; 30% r. h. and 60% F. conditions, 5.3 days.

 Back-blocking—Ridging or deformation at the panel joints may occur in gypsum board construction under adverse job or weather

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conditions. Back blocking end joints will minimize joint ridging and is recommended. Where back-blocking is used, float the end joints between supports and back-block with a 8" wide strip of gypsum board the full length of the joint adhesively applied over abutting ends. For fire-rated resilient construction, back butt-end joints with RC-1 Channels.

- 10. Fixture Attachment—Lightweight fixtures and trim should be installed using expandable anchors for screw attachment. Medium and heavyweight fixtures are not recommended on resilient surfaces, but if required, they should be supported from the primary framing.
- 11. Double-layer Laminated 1/2" Panels—In this assembly, use scaffold nails driven through gypsum blocks into the framing at third points vertically, or temporary shoring. The 11/2" USG Type G Screw is not recommended.
- 12. Acoustical Tile—Treatment of joints and screwheads with joint compound may be omitted where gypsum panels serve as a base for adhesively applied acoustical tile.
- 13. USG Exterior Gypsum Ceiling Board—Exposed surfaces should receive two coats of good quality exterior paint. First coat: oil-based primer; second coat: either alkyd or latex exterior paint.
- 14. Shadowing—During periods of low outside temperature, airborne dirt may collect, producing photographing or shadowing over fasteners and furring of exterior walls. This natural phenomenon occurs through no fault of the products.
- 15. WARNING: COMBUSTIBLE. FOAMULAR Polystyrene Insulation and other rigid foam insulation will ignite if exposed to fire of sufficient heat and intensity. Use only as directed by the specific instructions accompanying the product.
- 16. Additional Information—See U.S.G. technical folders in this series and in Sweet's General Building File: Construction Selector SA-100 for fire and sound-rated systems; Gypsum Panels & Accessories SA-927 for information on system components; Texture and Paint Products SA-933 for finishing product specification; FOAMULAR Insulation SA-710 for data on rigid polystyrene insulation.

Part 1: general

1.1 scope-Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

In cold weather and during gypsum panel joint finishing, temperatures within the building shall be maintained within the range of 55° to 70°F. (13° to 21°C). Adequate ventilation shall be provided to carry off excess moisture.

Part 2: products

2.1 materials

- a. Gypsum Board—48" wide—(1/4") (3/6") (1/2") (5/6") thick (Regular) (Foil-Back) Sheetrock Brand Gypsum Panels; (1/2") (5/6") thick (Foil-Back) Sheetrock Brand Firecode ("C") Gypsum Panels; 1/2" thick Textone Gypsum Panels (type) (finish); (1/2") (5/6") thick Sheetrock Brand W/R Gypsum Panels; (1/2") (5/6") thick Sheetrock Brand W/R Firecode "C" Gypsum Panels, 1/2" thick USG Exterior Gypsum Ceiling Board—lengths as required.
- b. Sheathing—1/2" USG (FIRECODE "C") Gypsum Sheathing; 0.4" USG Triple-Sealed Gypsum Sheathing; 1/2" GYP-LAP Gypsum Sheathing; (3/4") (1") (11/2") (2") FOAMULAR Polystyrene Insulation Sheathing.
- c. USG Direct Suspension System—Main Beam MB-12, Cross Furring

Channel CFC-4, Cross Beam CB-4, Wall Angle.

- d. Joint Treatment—(select a U.S.G. Joint System).
- e. Sealant-SHEETROCK Brand W/R Compound.

f. Adhesive

—(for Back-Blocking and Fire-Rated Double-Layer Systems)— DURABOND Joint Compound or USG Ready-Mixed Joint Compound—(All Purpose) (Taping).

—(for Non-Rated Double-Layer Systems)—Laminating or Liquid Contact Adhesive.

—(for Adhesive Application)—Drywall Stud Adhesive (must comply with ASTM C557 for Triple-Sealed Sheathing and in partitions.).
—(for Non-Rated Systems—specify with adhesive above)—Vinyl Foam Tape.

g. Fasteners

—USG Screws (11/4" Type W) (11/2" Type G) (3/6", 1", 11/4", 11/4", 11/6", 11/6" Type S) (1" Type S-12).

—(for Non-Rated Systems)—11/4", 13%" GWB-54 Annular Ring Nails—obtain locally.

—(for Fire-Rated Systems)—specify from fire test report.

—(for sheathing)—11-ga. (7/16'') (1") dia. head galvanized roofing nails (11/2'') (13/4') long—obtain locally.

h. USG Trim No. (200-A) (200-C) (401) (402) (P-1) (801-A) (801-B).

I. USG Corner Bead—(No. 103 Dur-A-BEAD) (No. 104 Dur-A-BEAD) (No. 800) Metal Corner Reinforcement.

J. USG Control Joint No. 093.

k. RC-1 Resilient Channel.

 THERMAFIBER Sound Attenuation Blankets (1½") (2") (3")x16" or 24"x48".

m. Caulking-USG Acoustical Sealant.

Part 3: execution

3.1 single-layer systems

3.1.1 gypsum panel erection—direct attachment

Apply gypsum panels to ceilings first, then to walls. Place panels (perpendicular to framing) (parallel to framing). Position all ends over framing members in parallel application. Use maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together. Stagger end joints in successive courses. Place end joints on opposite sides of partitions on different studs. When necessary, cut ends, edges and cutouts within the field of the panel in a workmanlike manner.

Drive fasteners in field of panel first, working toward ends and edges. Hold panel in firm contact with framing while driving fasteners. Space perimeter fasteners at least $\frac{3}{6}$ " from ends and edges. Drive nails home with heads slightly below surface of panels to provide a uniform dimple $\frac{1}{2}$ " deep. Do not use a nail set; avoid breaking face paper.

Attach gypsum panels to framing supports by:

a. Standard single nailing method—Attach panels with specified nails spaced 7" o.c. max. for ceilings, 8" o.c. max. for walls.

b. Adhesive application—Attach gypsum panels with drywall stud adhesive applied in a continuous %" bead at center of attachment to face of framing members. Where two panels meet on a framing member, apply two beads permitting adhesive contact to both panels. Do not apply adhesive to members such as bridging, diagonal bracing, etc., into which no supplemental fasteners will be driven. Immediately following panel erection, apply fasteners per manufacturer's directions. Hand impact panel along framing to insure contact at all points.

c. Double-nailing method—Attach gypsum panels with nails spaced 12" o.c. with second nails in close proximity (2" away).

d. Power-driven USG Screws—Attach gypsum panels with 11/4'' USG Type W Screws—spaced 16" o.c. max. for walls, 12'' o.c. for ceilings.

e. Vinyl Foam Tape—Attach gypsum panels, using drywall stud adhesive and vinyl foam tape applied in 8" long strips according to manufacturer's directions.

3.1.2 predecorated Textone Gypsum Panel erection

Before application, pre-bow panels to a 2" permanent bow convex to face of studs. Apply pre-bowed panels vertically to framing spaced

(16") (24") o.c. Position cut panels with cut edge at corner.

Apply drywall stud adhesive in continuous %" beads to face of studs in field of panel and in two %" beads at extreme edges of studs at vertical joints. Position panels within 15 min. after adhesive application and mechanically fasten 16" o.c. along ceiling and floor edges of panels. Impact panel by hand along framing to insure good contact at all points.

Finish panel joints, edges and corners with TEXTONE Mouldings matching specified panel finishes and installed according to manufacturer's directions.

3.1.3 SHEETROCK Brand W/R Gypsum Panel erection

a. Framing—If necessary, fur out studs so inside face of shower receptor is flush with gypsum panel face. Install appropriate blocking or headers to support tub and other plumbing fixtures, and to receive soap dishes, grab bars, towel racks and other hardware. When studs are more than 16" o.c., or when ceramic tile over 5/16" thick will be used, install suitable blocking between studs. Place blocking approximately 1" above top of tub or receptor and at midpoint between base and ceiling.

b. Gypsum Panels—After tub, shower pan or receptor is installed, place temporary 1/4" spacer strips around lip of fixture. Pre-cut panels to required sizes and make necessary cut-outs. Before installing panels, brush thinned SHEETROCK Brand W/R Compound over all cut or exposed panel edges at utility holes, joints and intersections.

Install panels perpendicular with paperbound edge abutting top of spacer strip. Fasten panels with nails 8'' o.c. max., or screws 16'' o.c. max. Where ceramic tile more than $^5/_{16}''$ thick will be used, space nails 4'' o.c. max. and screws 8'' o.c. max. Adhesive application (see 3.1.1 b above) may be used for attaching panels when ceramic tile no more than $^5/_{16}''$ thick will be used.

In areas to be tiled, treat all fastener heads with SHEETROCK Brand W/R Compound. Fill tapered edges in gypsum panel with SHEETROCK Brand W/R Compound, embed PERF-A-TAPE Reinforcement firmly, and wipe off excess compound. Follow immediately with a second coat over the taping coat, being careful not to crown the joint. Fold and embed tape properly in all interior angles to provide a true angle.

In areas not to be tiled, apply first coat to fastener heads with SHEETROCK Brand W/R Compound. Finish face panel joints, internal angles, and fasteners with a U.S.G. Joint Compound applied according to directions.

Prior to tile erection, fill all openings around pipes, fittings and fixtures with SHEETROCK Brand W/R Compound. Remove spacer strips but do not caulk gap at bottom edge of panels.

Note—Using an adhesive approved by the tile manufacturer, install tile down to top edge of shower floor or tub and overlapping lip or return of tub or receptor. Fill all tile joints with an unbroken application of grout. Apply caulking compound between tile and shower floor or tub.

3.1.4 back-blocking system

Note—Maximum spacing of supports, 24" o.c. Select Sections **a** or **b**, depending upon job requirements. Floating and tapering end joints requires back-blocking. However, end joints may be back-blocked without tapering.

a. Float, back-block and taper all ceiling end joints except at perimeter of room.

b. Back-block all ceiling edge joints except at perimeter of room.

c. Apply Sheetrock Brand Gypsum Panels with long edges perpendicular to framing and with end joints midway between supports. Wood backing behind joints between framing supports is not required. Use 3/6" or 1/2" thick gypsum backing blocks for 1/2" ceiling finish; 1/2" or 5/6" thick blocks for 5/6" ceiling finish. Apply adhesive to face side if foil-backed blocks are used.

3.1.5 floating Interior angle system

Apply gypsum panels to ceilings first. Follow standard framing practices for corner fastening. Fit panels snugly at all angles. Apply gypsum panels to walls to maintain firm support for ceiling panels. At horizontal angles, apply the first fastener 8" from the intersection. At vertical interior angles attach the overlapping panel only, at the angle. Use conventional fastening in remainder of area.

3.2 double-layer systems

3.2.1 base layer erection—direct attachment

- a. **Cellings**—Apply gypsum panel base layer on ceilings first (perpendicular to framing) (parallel to framing). Position end joints to offset face layer joints by at least 10"; joints may occur on or between framing members. Apply foil-back panels with foil side against framing.
- b. Sidewalls—Apply gypsum panel base layer with long edges centered on framing members (parallel). When predecorated face layers will be used, apply base layer horizontally. Apply foil-back panels with foil side against framing. Attach panels to framing supports by (screw) (nail) attachment as follows:
- c. Screw Attachment—Attach panels with power-driven 11/4" Type W Screws spaced 24" o.c. max. Stagger screws on adjoining edges and ends.
- d. Nail Attachment—Attach panels with specified nails spaced 24" o.c. max. Drive nails so heads are flush with surface and opposite each other on adjacent ends and edges.

Drive fasteners in field of panel first, working toward ends and edges. Hold panel in firm contact with framing while driving fasteners. Space fasteners %" min. from ends and edges.

3.2.2 face layer erection—direct attachment

Use gypsum panels in maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together. Stagger joints at least 10" from parallel joints in base layer. When necessary, cut ends, edges and cutouts within field of panels in a workmanlike manner.

After panels are cut to size, mix and apply adhesive according to manufacturer's directions and laminate face layer to base layer in the following manner:

Sheet Lamination—For fire-rated construction on walls, apply specified DURABOND Joint Compound or USG Ready-Mixed Joint Compound to entire back surface of face panels and to extreme edges of panels. Apply adhesive in beads approximately 3%" wide at base and ½" high and spaced 1½" to 2" o.c. Laminate face layer to base layer using moderate pressure and temporary support or supplemental fastening as follows:

- a. Temporary nailing—Use nails with at least ¾" penetration into framing. Space nails 16" to 24" o.c. When proper bond is developed, remove nails and dimple holes for joint treatment.
- b. Temporary supports—Brace or shore face layer every 16" to 24". When proper bond is developed, remove supports.
- c. USG Screws—Permanently attach face layer with 11/2" Type G Screws. Space screws along edges 36" o.c. max., within 2" of joint and 12" of both ends. In field of panel, space screws along centerline, 48" max. and within 24" of ends.

Strip Lamination—For fire-rated construction on walls, apply specified DURABOND Joint Compound or USG Ready-Mixed Joint Compound to base layer panels in vertical strips of four ½" beads, 1½" to 2" o.c. Space strips 24" o.c. Permanently attach face layer with 1½" Type G Screws placed to penetrate adhesive strips. Space screws along edges 36" o.c. max., within 2" of joint and 12" of both ends. In field of panel, space screws along centerline, 48" o.c. max. and within 24" of both ends.

For non-rated construction, laminate face panels to base layer as follows:

Laminating Adhesive—Apply adhesive in strips using notched spreader having ¼"x¼" min. notches spaced 2" o.c. max. Apply strips to back of face panel in center and along both edges. Position panel, press firmly in place and fasten as required. For walls, use pre-bowed panels, erect panels vertically and fasten 16" o.c. at top and bottom of panel. For ceilings, space fasteners 16" o.c. along edges and ends, with one permanent fastener per framing member at mid-width of panel. Liquid Contact Adhesive—Apply adhesive to both contact surfaces according to manufacturer's directions; let adhesive air-dry; erect panels as soon as possible after drying. Position panel, press panel firmly in place and fasten as required. For perpendicular application to walls and for all ceiling applications, fasten face panel at each corner and along edges spaced 48" o.c. max. For parallel application to walls,

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use pre-bowed panels and fasten 16" o.c. at top and bottom of panel. Vinyl Foam Tape—Attach gypsum panels, using laminating adhesive and vinyl foam tape applied in continuous strips across back face of panel according to manufacturer's directions.

For mechanical attachment in non-rated construction, space nails 7" o.c. on ceilings, 8" o.c. on walls; space USG Screws 12" o.c. on ceilings, 16" o.c. on walls.

3.2.3 face layer erection—Textone Gypsum Panels

Before application, pre-bow panels to a 2" permanent bow convex to face of studs. Apply pre-bowed panels vertically with joints staggered at least 10" from parallel joints in base layer. Position less-than-full-width panels with cut edge at corner. When necessary, cut ends, edges and cutouts within field of panels in a workmanlike manner.

For fire-rated construction, install panels using specified DURABOND Joint Compound or USG Ready-Mixed Joint Compound as laminating adhesive. Apply adhesive to base layer in vertical strips of four ½" beads, 1½" to 2" o.c. Space strips 24" o.c. Fasten panels 16" o.c. at top and bottom of panel.

For non-rated construction, install face layers, using (laminating) (liquid contact) adhesive as follows:

- a. Laminating Adhesive—Apply adhesive in strips using notched spreader having ¼"x¼" min. notches spaced 2" o.c. max. Apply strips to back of face panel in center and along both edges. Position panel, press firmly in place and fasten 16" o.c. at top and bottom.
- b. Liquid Contact Adhesive—Apply adhesive to both contact surfaces according to manufacturer's directions; let adhesive air-dry; erect panels as soon as possible after drying. Position panel, press firmly in place and fasten 16" o.c. at top and bottom.

Finish panel joints, edges and corners with TEXTONE Mouldings matching specified panel finishes and installed according to manufacturer's directions.

3.3 resilient attachment systems

3.3.1 resilient channel erection

Position resilient channels at right angles to wood framing, space (16") (24") o.c. and attach to supports with 11/4" Type W, 11/4" Type S or 1" Type S Screws driven through holes in channel mounting flange.

On walls, install channels with mounting flange down, except at floor. Locate channels 2" from floor and within 6" of ceiling. Extend channels into all corners and attach to corner framing. Position channels max. 6" from wall-ceiling angle. Cantilever channel ends no more than 6". For double-layer system, attach channel through base layer to framing with 1%" Type S Screws.

Splice channel by nesting directly over framing member; screwattach through both flanges. Reinforce with screws located at both ends of splice.

Where cabinets are to be installed, attach RC-1 Channels to studs at center of top and bottom cabinet hanger brackets. When distance between hangers exceeds 24" o.c., install additional channel at midpoint between hangers.

Note: Screws attaching cabinets to RC-1 Channels should be placed between studs. Screws that contact studs reduce the system's resiliency and sound rating.

3.3.2 gypsum panel erection—walis

Apply gypsum panels of maximum practical length with long dimension parallel to resilient channel and fastened with 1" Type S Screws spaced 12" o.c. along channels. Center horizontal abutting edges over screw flange of channel. Where channel resiliency makes screw placement difficult, the next longer screw may be used but do not drive screw directly over stud. For direct attachment, fasten panels to wood studs with 6d nails 8" o.c.

For two-layer application of gypsum panels, apply base layer perpendicular to resilient channels and attach to channels with 1" Type S Screws spaced 24" o.c. and to wood studs with 11/4" Type W Screws 16" o.c. Apply face layer with long dimension perpendicular to long edges of base layer and fasten with 15%" Type S Screws 16" o.c.

3.3.3 gypsum panel erection—ceilings

- a. Base Layer—For fire-rated assembly, apply gypsum base-layer panels with long edges across joists and end joints staggered. Fasten panels to framing with 8d cement-coated nails spaced 7" o.c. Attach resilient channel through base layer perpendicular to framing with 1%" Type S Screws.
- b. Face Layer—Apply face-layer panels of maximum practical length with long dimension perpendicular to resilient channels and end joints staggered. End joints may occur over resilient channels or midway between channels with joint floated and back-blocked. Fit ends and edges closely, but not forced together. Fasten panels to channels with 1" Type S Screws spaced 12" o.c. in field of panels and along abutting ends. Cut panels neatly and provide support at cutouts and openings.

3.3.4 direct suspension system—ceilings

Attach wall angles at ceiling height. Space 12-ga. hanger wires 48" o.c. along main beams, within 6" of beam ends and walls not having wall angles. Install main beams 48" o.c. and within 6" of walls. Align main beam slots for cross furring channel and splice ends to insure continuity in each row.

Space cross furring channels 24" o.c., within 6" of walls without wall angles, at panel end joints and 8" from gypsum panel end joints. Snap-lock ends to main beam and secure ends to wall angles with positive attachment.

At light fixtures, place hangers at each corner and at mid span of cross beams. Install two cross beams to support lighting fixture and additional cross furring channels 8" from each side of fixture.

Apply (½") (5%") SHEETROCK Brand FIRECODE "C" Panels of maximum practical length with long dimension perpendicular to cross furring channels. Center end joints under channels and stagger in adjacent rows. Fit ends and edges closely but not forced together. Fasten panels to beams and channels with 1" Type S-12 Screws spaced 12" o.c. in field of panels and along abutting ends and edges. Apply gypsum panel fixture protection over all light fixtures.

3.4 wall furring systems

3.4.1 single-layer application—direct attachment

Space suitable wood furring strips 16" o.c. and attach to masonry walls. Apply gypsum panels of maximum practical length with long dimension perpendicular to furring strips. Fasten panels with 11/4" Type W Screws spaced 16" o.c. Apply foil-back panels with foil side against furring. Where there is a possibility of water penetration through exterior walls, install an asphalt felt strip between furring strips and wall.

3.4.2 mechanical application—Z-furring channels

Erect insulation vertically on interior of masonry and concrete walls and hold in place with Z-furring channels spaced 24" o.c. Except at exterior corners, attach narrow flanges of furring channels to wall with concrete stub nails or power-driven fasteners spaced 24" o.c. At exterior corners, attach wide flange of furring channel to wall with short flange extending beyond corner. On adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with a standard width insulation panel and continue in regular manner. At interior corners, space second channel no more than 12" from corner and cut insulation to fit. Hold mineral-fiber insulation in place until gypsum panels are installed with 10" long staple field-fabricated from 18-ga. tie wire and inserted through slot in channel. Apply wood blocking around window and door openings and as required for attachment and support of fixtures and furnishings.

Apply gypsum panels parallel to channels with edge joints occurring over channels. Use no end joints in single-layer application. Attach gypsum panels with 1" Type S Screws spaced 16" o.c. in field of panels and at edges, and with 11/4" Type S Screws spaced 12" o.c. at exterior

corners. For double-layer application, apply base layer parallel to channels, face layer either perpendicular or parallel to channels with vertical joints offset at least one channel. Attach base layer with screws 24" o.c. and face layer with 1%" screws 16" o.c.

3.5 sheathing application

3.5.1 gypsum sheathing

Apply 24" wide sheathing horizontally with tongue edge up. Install supplementary bracing as required by applicable code. Fasten sheathing with nails spaced 8" o.c. along each stud.

Apply 48" wide sheathing vertically with bottom edge bearing on foundation or subfloor. Install supplementary bracing (and adhesive) as required by applicable code. Fasten sheathing to studs and plates with nails 8" o.c.

3.5.2 polystyrene insulating sheathing

Apply 2-ft. wide Foamular Insulation horizontally with tongue edge up, or 4-ft. wide insulation vertically, to outside of braced framing. For wood studs use $^{7}/_{16}$ " crown staples spaced 8" o.c., $^{3}/_{16}$ " crown staples spaced 12" o.c., $^{7}/_{16}$ " diam. head roofing nails spaced 12" o.c. or 1" diam. head nails spaced 24" o.c. to attach panel. Cover all framing with panels and fit joints tightly.

3.6 exterior ceilings and soffits

Apply USG Exterior Gypsum Ceiling Board (perpendicular to supports) (parallel to supports) with end joints over supports and with \$^1/16''\$ to \$^4''\$ space between butted ends of boards. Use maximum practical lengths to minimize end joints. Fasten boards to supports with screws spaced \$12''\$ o.c. or nails spaced \$8''\$ o.c. Where specified, cover joints with wood battens securely fastened to framing. Finish joints, trim and fasteners with exterior joint system applied according to manufacturer's directions.

3.7 accessory application

- a. Joint System—Finish all face panel joints and internal angles with a U.S.G. Joint System installed according to manufacturer's directions. Spot exposed fasteners on face layers and finish corner bead, control joints and trim as required, with at least three coats of joint compound, feathered out onto panel faces and sanded smooth.
- **b. Corner Bead**—Reinforce all vertical and horizontal exterior corners with corner bead fastened with nails or 9/16'' galvanized staples 9'' o.c. on both flanges along entire length of bead.
- **c. Metal Trim**—Where partition or ceiling terminates against masonry or other dissimilar material, apply metal trim over gypsum panel edge and fasten with nails or galvanized staples 9" o.c.
- **d. P-1 Vinyl Trim**—Slip trim over gypsum panel edge with long flange behind panel. Install panel with trim firmly abutting surface.
- e. Screws—Power-driven at least %" from edges or ends of gypsum panels to provide uniform dimple 1/32" deep.
- f. Control Joints—Break gypsum panels and resilient channels behind joint and back by double supports. Attach control joint to face layer with nails or $^9/_{16}$ " galvanized staples spaced 6" o.c. on both flanges along entire length of joint.

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Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

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USG Area Separation Walls

_	fire-rated construction	acous	tical performance	
fire rating	description & test no.	STC	description & test no.	
2 hr.	Cavity Area Separation Wall—1/2" SHEETROCK brand W/R*FIRECODE "C" gypsum panels —1" USG gypsum liner panels set betw USG steel C-H studs 24" o.c.—single layer panels ea side appl vert & screw att—joints stag on opp sides & fin—perim caulked— U of C 6-23-75 wt 9 width 31/2"	47	Based on 1" sound atten, blankets in cavity—BBN-750704	A
2 hr. est	Cavity Area Separation Wall—½" SHEETROCK brand W/R FIRECODE "C" gypsum panels— 1" USG gypsum liner panels set betw USG steel C-H studs 24" o.c.—RC -1 chan 24" o.c. screw att to side opp liner panels—1½" THERMAFIBER sound atten blkts —single layer panels ea side appl vert & screw att—joints stag on opp sides & fin— perim caulked—est. fire rating based on U of C 6-23-75 wt 10 width 4"	50	BBN-750411	В
2 hr. est	Solid Area Separation Wall—56" SHEETROCK brand FIRECODE "C" gypsum panels—two 1" gypsum liner panels set betw USG steel H-studs 24" o.c.—2 x 3 wd studs 16" o.c. ea side on 2 x 3 plates 1" from liner panels—gypsum panels att with 1¼" Type W screws 12" o.c.—joints stag & fin—perim caulked—est. fire rating based on T-4481-OSU and T-1339-OSU wt 16 width 10¼"	45 54 57	BBN-730104 Based on 2" sound atten. blankets in one cavity—BBN-730103 Based on 2" sound atten. blankets in both cavities—BBN-730102	С
3 hr. est	Cavity Area Separation Wall—%" SHEETROCK brand W/R FIRECODE "C" gypsum panels —1" USG gypsum liner panels set betw USG steel C-H studs 24" o.c.—RC-1 chan 24" o.c. screw att to side opp liner panels—11%" THERMAFIBER sound atten blkts —single layer panels one side appl vert & screw att—2 layers opp side screw att to chan —base layer appl horiz—face layer appl vert—joints fin—perim caulked—est. fire rating based on U of C 2-16-72	57	BBN-730622	D
3 hr.	Solid Area Separation Wall—two 1" gypsum liner panels set betw USG steel H-studs 24" o.c.——2" THERMAFIBER sound atten blkts ea side—blkts appl horiz with joints stag and staple-att to liner panels—WHI-495-0393/0394 wt 9 width 6"	N/A		E

description

USG Area Separation Walls are remarkable developments for constructing common walls with fire-resistive protection for adjacent properties. These lightweight, non-load bearing gypsum drywall assemblies are designed as vertical fire barriers for fire walls and party walls separating occupancies in wood-frame apartments and townhouses. They are the essence of simplicity—large-size gypsum panels attached to steel studs and runners quickly become thin, space-saving walls offering remarkable acoustical privacy. Their engineered performance and low labor and material costs make these systems superior to the usual masonry construction.

Available in two basic systems both providing fire-resistant walls from ground level to roof:

Cavity Type, with integral interior gypsum panel surfaces for commonly shared party walls between apartments.

Solid Type, with independently framed interior gypsum panel surfaces both sides of fire wall or party wall; slightly higher cost.

Cavity-Type Wall consists of steel C-H Studs and gypsum liner panels set in steel runners and faced both sides with SHEETROCK Brand W/R FIRECODE "C" Gypsum Panels. Liner panels, 1" thick, are erected vertically with ends set into 21/2" USG J-Runners and edges inserted into specially formed 21/2" USG Steel C-H Studs screwattached to runners. J-Runners are installed singly at top and bottom of wall and back-to-back between vertical liner panels on a line 3" to 9" above each intermediate floor. Aluminum clips, which attach the studs to adjacent wood framing, break away when exposed to fire, thus permitting a fire-damaged structure to fail while the fire barrier remains intact. To improve sound transmission loss, THERMAFIBER Sound Attenuation Blankets are inserted in the stud cavity and RC-1 Resilient Channels may be used to isolate the face layer. With 212CH25 steel studs spaced 24" o.c., the systems are suitable for floor-to-ceiling heights up to 11 ft. under 5-psf lateral load and up to 8 ft. as exterior walls under 15-psf wind load without exceeding 1/240 deflection.

Solid-Type Wall consists of two 1" thick gypsum liner panels installed vertically between 2" USG Steel J-Runners. Panel edges are inserted in 2" USG Steel H-Studs spaced 24" o.c. and screw-attached to runners. J-Runners are installed at top and bottom of wall and back-to-back between vertical panels 3" to 9" above each intermediate floor. Back-to-back horizontal runners are attached to wood framing with 0.063" aluminum angle clips which break away in the same fashion as with cavity-type walls. With 24-ga. steel H-studs, the

assembly is suitable for floor-to-ceiling heights up to 10 ft. under 5-psf lateral load and up to 8 ft. as an exterior wall under 15-psf wind load without exceeding 1/240 allowable deflection.

With 2"THERMAFIBER Sound Attenuation Blankets stapled each side of liner panels, the assembly has obtained a 3-hr. fire resistance rating allowing separate selection and construction of tenant walls.

Components used in these systems are designed to permit temporary exposure to inclement weather during construction. Moisture-resistant paper facings on USG Gypsum Liner Panels shed water, protect the special fire-resistant core. Runners and studs are corrosion-resistant steel. The THERMAFIBER Sound Attenuation Blankets may be wrapped in vinyl film, if required. SHEETROCK Brand W/R FIRECODE "C" Panels, ½" or 5%" thick, have a water-resistant gypsum core and multilayered paper chemically treated to combat moisture penetration.

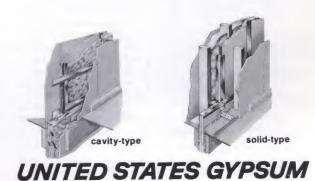
Construction using the breakaway aluminum clip is covered by U.S. Patent No. 3,974,607.

function and utility

These systems may be used in buildings up to four stories high and with all common floor-ceiling heights found in multi-family housing. Both cavity and solid types are suitable for exterior walls with appropriate weather-resistant facing when building offsets are desired; also for use with flat wood decks.

Fire Resistance—Both types of Separation Walls offer 3-hr. fire ratings (see table above).

Sound Isolation—STC ratings up to 57 are available in both types (see table above).



Lightweight—These drywall assemblies weigh at least 50% less than masonry walls usually used. This fact speeds installation.

Space-Saving—Use of these assemblies gains valuable floor space. Thickness is 31/2" to 4" for Cavity Type Walls, compared to 8" to 12" for a masonry wall without interior finish.

Weather Resistance-Moisture-resistant components permit installation in any weather men can work-eliminate many costly winter construction delays.

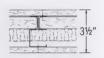
limitations

Non-load bearing; max. frame spacing: 24"; not recommended for shear walls without suitable diagonal bracing.



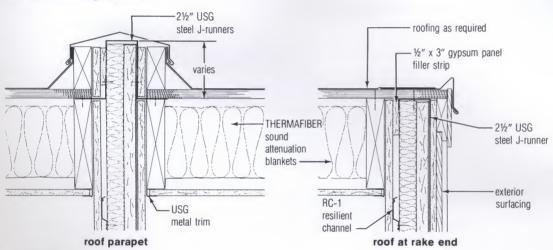
rated assemblies

cavity walls



2 Hr. est. based on U of C 6-23-75 47 STC-BBN-750704

details/cavity walls

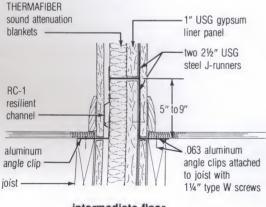


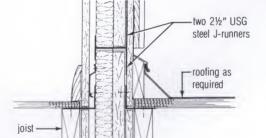


2 Hr. est. based on U of C 6-23-75 50 STC-BBN-750411

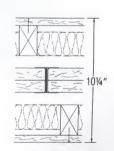


3 Hr. est. based on U of C 2-16-72 57 STC-BBN-730622

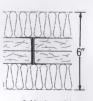




solid walls

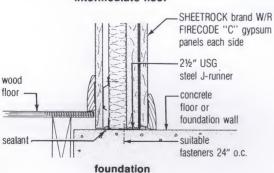


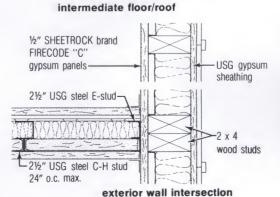
2 Hr. est. based on T-4481-OSU 57 STC-BBN-730102 blkts. 2 sides



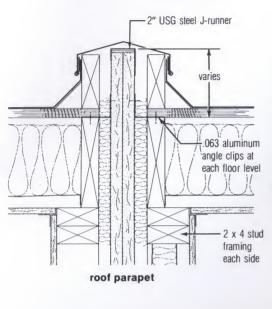
3 Hr. based on WHI-495-0393/0394

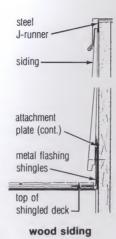
intermediate floor

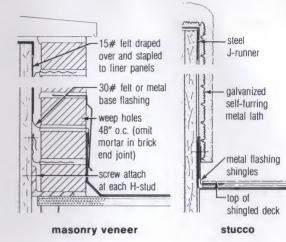


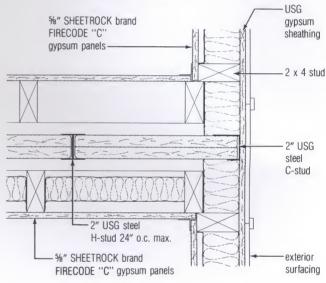


optional roof intersections









two 2" USG
steel J-runners

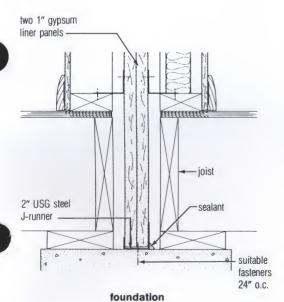
THERMAFIBER
sound
attenuation
blankets

%" type S
pan head screw

insulation
fire blocking at
each floor level

intermediate floor

exterior wall intersection



specifications—notes to architect

- 1. System Performance—U.S.G. will provide test certification for published fire, sound and structural data covering systems designed and constructed according to its published specifications. Tests are conducted on U.S.G. products assembled to meet performance requirements of established test procedures specified by various agencies. System performance following any substitution of materials or compromise in assembly design cannot be certified and may result in failure under critical conditions.
- 2. Control Joints—Gypsum panel surfaces should be isolated with control joints or other stress relief where: (a) partition abuts a structural element (except floor) or dissimilar wall or ceiling; (b) construction changes within the plane of the partition; (c) partition run exceeds 30'; (d) expansion or control joints occur in the base exterior wall.
- 3. Sound Control Construction—Where these constructions are used for sound control, the use of USG Acoustical Sealant is recommended to seal all cut-outs, such as at electrical boxes, and at the perimeter of the assembly. Flanking paths and back-to-back penetrations of the diaphragm should be eliminated. Exterior wall surfaces should be resiliently mounted to minimize flanking paths between floor and ceiling construction. Door and borrowed-light openings are not recommended.
- 4. Wood Framing Requirements—Wood framing meeting the minimum requirements of HUD/FHA, American Softwood Lumber Standard and local building codes is necessary for proper performance.

- 5. Fixture Attachment—Lightweight fixtures and trim should be installed using expandable anchors for screw attachment. Medium and heavyweight fixtures are not recommended on resilient surfaces, but if required, they should be supported from the primary framing.
- **6. Cavity Type Walls**—FIRECODE "C" panels may be used when partitions will not be exposed to moisture or inclement weather during construction.
- 7. Additional Information—See U.S.G. technical folders in this series and in Sweet's General Building File: Construction Selector SA-100 for fire and sound-rated systems; Gypsum Panels and Accessories Folder SA-927 for information on systems components; Texture and Paint Products Folder SA-933 for finishing product specifications; Building and Acoustical Insulation Folder SA-705 for insulation specifications.

Part 1: general

1.1 scope-Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

In cold weather and during gypsum panel joint finishing, temperature within the building shall be maintained within the range of 55° to 70°F (13° to 21°C). Adequate ventilation shall be provided to carry off excess moisture.

Part 2: products

2.1 materials

- a. Gypsum Board—48" wide, (½") (5%") thick (Regular) (Foil-Back) SHEETROCK Brand (W/R) (FIRECODE "C") Gypsum Panels—lengths as required.
- Liner Board—24" wide, 1" USG Gypsum Liner Panels, beveled edge, lengths as required.
- c. USG Steel C-H Studs 212CH25, hot-dipped galvanized, lengths as required.
- d. USG Steel H-Studs 200HS24, hot-dipped galvanized, lengths as required.
- e. USG Steel F-Studs 212ES25, hot-dipped galvanized, lengths as required.
- f. USG Steel C-Studs 200CS24, hot-dipped galvanized, lengths as required.
- g. USG Steel J-Runners (200JR24) (212JR24), hot-dipped galvanized, x 10' length.
- h. Angle Clip—2" x 21/2" x 0.063" aluminum angle clip.
- i. Joint Treatment—(select a U.S.G. Joint System).
- j. Fasteners—USG Screws (11/4" Type W) (1", 11/4", 15/6" Type S) (3/6" Type S, pan head).
- k. USG Trim No. (200-A) (200-C) (401) (402) (801-A) (801-B).
- I. USG Control Joint No. 093.
- m. RC-1 Resilient Channel.
- n. THERMAFIBER Sound Attenuation Blankets (11/2") (2") x 16" or 24" x 48".
- . USG Acoustical Sealant.

Part 3: execution

3.1 cavity wall

- a. Foundation—Position 2%"-wide steel J-runner at floor and securely attach to foundation with power-driven fasteners at both ends and spaced 24" o.c. Caulk runner at foundation with $\frac{1}{4}$ " bead of USG Acoustical Sealant.
- b. First floor—Install 1" liner panels and steel studs cut to length 3" to 9" more than floor-to-floor height. Erect liner panels vertically in J-runner with long edges in groove of C-H stud. Install C-H studs between panels and cap ends of run with E-stud. Fasten studs to bottom J-runner with %" Type S Screws.
- c. Intermediate floors—Cap top of panels and studs with J-runner and fasten studs to J-runner flanges with %'' Type S Screws. Install bottom J-runner for next row of panels over top runner with end joints staggered at least 12". Fasten runners together with double %'' screws at ends and spaced 24" o.c. Secure each stud to framing with 0.063" aluminum angle clip, fastened to studs with %'' screws and to framing or subfloor with 11/4" Type W Screws.
- d. Roof—Continue erecting studs and panels for succeeding stories as previ-

- ously described. At roof, cap panels with J-runner and fasten studs to flanges with 3%" screws. Fasten studs to framing with aluminum clips.
- e. Sound attenuation blankets—Install blankets between studs and attach to liner panel with five $^9/_{16}$ " staples driven through each blanket, one in center and others spaced 3" from each corner. Butt blankets closely and fill all voids.
- f. Resilient channels—When specified, install RC-1 Resilient Channels horizontally to face side of studs, 6" above floor, 6" below ceiling joists and max. 24" o.c. Attach channels to studs with %" Type S Screws driven through holes in mounting flange. Extend channels to ends of runs and attach to E-studs. Splice channel by nesting directly over stud; screw-attach through both flanges. Reinforce with screws at both ends of splice.
- g. Gypsum panels—Apply $\frac{1}{2}$ " SHEETROCK Brand W/R FIRECODE "C" Gypsum Panels vertically to both sides of studs. Stagger joints on opposite partition sides. Fasten panels with 1" Type S Screws spaced 12" o.c. in field and along edges and runner flanges.
- h. Resilient single-layer—Apply ½" gypsum panels vertically to resilient channels and fasten with 1¼" Type S Screws placed 6" away from stud and 12" o.c. Do not place screws directly over stud.
- **I. Resilient double-layer**—Apply %" gypsum panel base layer perpendicular to resilient channels with joints staggered; fasten with 11/4" Type S Screws placed 6" away from stud and 12" o.c. Apply 5%" gypsum panel face layer vertically over base layer with edge joints staggered and attach with 15%" Type S Screws spaced 12" o.c. and staggered from those in base layer.

3.2 solid wall

- **a. Foundation**—Position 2" wide steel J-runner at floor and securely attach to foundation with power-driven fasteners at both ends and spaced 24" o.c. When specified, caulk runner at foundation with 1/4" bead of acoustical sealant.
- b. First floor—Install liner panels and H-studs cut to convenient length more than floor-to-floor height. Install two thicknesses of 1" liner panels vertically in J-runner with long edges in H-stud. Erect H-studs and double-thickness panels alternately until wall is completed. Cap ends of run with C-stud. Fasten all studs to J-runner flange with 3%" Type S Screws.
- c. Intermediate floors—Cap top of panels and studs with back-to-back J-runners screw-attached together with double 36'' Type S Screws at ends and spaced 24'' o.c. Fasten studs to runner flange with 36'' screws. Secure studs to framing with 36'' aluminum angle clips screw-attached to studs and framing. Except at foundation, install fire blocking between joists and fire barrier.
- d. Roof—Continue erecting studs and panels for succeeding stories as previously described. At roof, cap panels with J-runner and fasten to studs with %" screws. Fasten studs to framing with aluminum clips.
- e. Sound attenuation blankets—Install blankets both sides of liner panels with joints staggered. Attach blankets with seven $\%_{16}''$ staples randomly driven through each blanket. Butt blankets closely and fill all voids.
- f. Interior finish—Apply single-layer 5%" SHEETROCK Brand FIRECODE "C" Panels to wood studs and joists with screws or nails in conventional manner.

3.3 accessory application

- a. Joint System—Finish all face panel joints and internal angles with a U.S.G. Joint System installed according to manufacturer's directions. Spot exposed fasteners on face layers and finish corner bead, control joints and trim as required, with at least three coats of joint compound, feathered out onto panel faces and sanded smooth.
- b. Metal Trim—Where partition or ceiling terminates against masonry or other dissimilar material, apply metal trim over gypsum panel edge and fasten with nails or galvanized staples 9" o.c.
- c. Screws—Power-drive at least 3/8" from edges or ends of gypsum panels to provide uniform dimple 1/32" deep.
- **d. Control Joints**—Break gypsum panels and resilient channels behind joint and back by double supports. Attach control joint to face layer with nails or $\%_{16}$ " galvanized staples spaced 6" o.c. on both flanges along entire length of joint.

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, SHEETROCK, FIRECODE, DUR-A-BEAD, THERMAFIBER, RC-1.

Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

description and utility

There is only one SHEETROCK—the brand of gypsum panels for interior wall and ceiling surfaces developed and improved by United States Gypsum. This product, in the last quarter-century, has revolutionized construction—to the point that today more than 90% of all new residential buildings are finished with gypsum panels. Systems using SHEETROCK Brand Panels now have gained the same acceptance in commercial building.

SHEETROCK is a brand of mill-fabricated gypsum panel composed of a fire-resistant gypsum core encased in a heavy natural-finish paper on the face side and a strong liner paper on the back side. The face paper is folded around the long edges to reinforce and protect the core, and the ends are square-cut and finished smooth. In SHEETROCK Brand SW Gypsum Panels, an exclusive rounded edge design strengthens the joint and reduces imperfections in finishing.

Gypsum panels are produced in specialized forms for various applications. Complementing these is the industry's broadest line of accessories, adhesives and joint treatment materials to provide complete partition, ceiling and floor assemblies. This catalog covers these products in five groups: (1) Gypsum Panel Products; (2) Trim Accessories; (3) Structural Accessories; (4) Screws and Adhesives; (5) Joint Treatment and Texture Products. A general specification appears on pages 10-12; detailed data on assemblies using these components are covered in pertinent U.S.G. System Folders.

Interior walls and ceilings built with SHEETROCK Brand Panels gain a durable surface suitable for any type of decorative treatment and for repeated decoration during the life of the building. Joints between adjacent panels may be reinforced and concealed with a U.S.G. joint treatment system, or may be featured by leaving exposed or covering with decorative mouldings.

Dry Construction—factory-fabricated gypsum panels eliminate excessive moisture in construction.

Speed—Panels are easily cut and quickly applied.

Quick Decoration—essentially a "dry" material, gypsum panels permit painting or other decoration, and the installation of metal or wood trim, almost immediately.

Fire Protection—the gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F. until completely calcined—a slow process. See U.S.G. Construction Selector SA-100 for fire-resistance ratings.

Crack Resistance—with joints reinforced by one of the U.S.G. joint systems, SHEETROCK Brand SW Panels form walls and ceilings exceptionally resistant to cracks caused by frame movement, vibration or minor settlement.

Non-Warping—expansion or contraction under normal atmospheric changes is negligible and does not cause harmful warping or buckling. Availability—over 20 strategically located U.S.G. operating plants produce and/or stock the gypsum panel materials described here. Special distribution centers, in addition to these plants, increase total service efficiency to major markets and rural areas from coast to coast. All standard or specialty gypsum panel products may be considered readily available and easily procured upon short notice.

general limitations

- 1. Exposure to excessive or continuous moisture and extreme temperatures should be avoided. Gypsum board is not recommended in solar heating systems where board will be in contact with surfaces exceeding 125°F. (52°C).
- 2. Must be adequately protected against wetting when used as a base for ceramic or other wall tile (see foil-back panel limitation). Use SHEETROCK Brand W/R Gypsum Panels for this purpose.
- 3. Maximum spacing of framing members: 1/2'' and 5/6'' gypsum panels are designed for use on framing centers from 16" to 24"; 3/6''



and ¼" panels, on centers up to 16". In both walls and ceilings, when ½" or %" gypsum panels are applied across framing on 24" centers and joints reinforced, headers are not required. ¾" and ¼" SHEETROCK Brand Panels not recommended for use on steel framing nor as base for water-based texturing materials. For this finish, ½" or %" gypsum panels are applied across framing. For best results, %" gypsum panels should be used. See pertinent system folders for recommended framing spacing.

- **4.** Application of Sheetrock Brand Panels over 34" wood furring applied across framing is not recommended since the relative flexibility of the furring under impact of the hammer tends to loosen nails already driven. Furring should be 2"x2" minimum (may be nom. 1"x4" if panels are to be screw-attached).
- 5. The application of gypsum panels over an insulating blanket, that has first been installed continuously across the face of the framing members, is not recommended. Blankets should be recessed and the blanket flanges attached to sides of studs or joists.
- **6.** To prevent objectionable sag in new gypsum panel ceilings, the weight of overlaid unsupported insulation should not exceed 1.3 psf for ½" thick panels with frame spacing 24" o.c.; 2.2 psf for ½" panels on 16" o.c. framing and %" panels 24" o.c.; %-in. thick panels must not be overlaid with unsupported insulation. A vapor retarder should be installed in exterior ceilings, and plenum or attic space properly vented. In winter or cold climates, a polyethylene vapor retarder should not be used unless insulation is installed before ceiling panels.

Water-based texturing materials applied to ceilings should be completely dry before insulation and vapor retarder are installed. Under most conditions, drying takes several days; i.e., 10% r.h. and 90°F. conditions require 1.5 days; 90% r.h. and 90°F conditions, 10.5 days; 30% r.h. and 60°F. conditions, 5.3 days.

7. To improve fastener concealment where gypsum panel walls and ceilings will be subjected to severe side lighting and be decorated with a water-based paint, dust surface and apply a good quality alkyd (oil) based primer/sealer prior to decoration. However, when using this procedure, care should be taken to avoid roughening the surface paper if sanding is used to smooth the joint compound.

technical data

SHEETROCK Brand Gypsum Panels comply with Federal Specification SSL-30D; ASTM C36. Thermal coefficient of expansion (unrestrained): 9.0 x 10⁻⁶ in. per in. per deg. F. (40°—100°F); hygrometric coefficient of expansion (unrestrained); 7.2 x 10⁻⁶ in. per % r.h. (5%—90% r.h.). Surface burning characteristics: flame spread 15, fuel contributed 15, smoke developed 0.

UNITED STATES GYPSUM

types and functions

1. Gypsum Panel Products

SHEETROCK Brand Regular Gypsum Panels have long edges tapered on the face side to form a shallow channel for joint reinforcement. Made in four thicknesses for specific purposes:

—5/4", recommended for the finest single-layer drywall construction. The greater thickness provides increased resistance to fire and transmission of sound. Recommended for ceilings when a water-based texturing material will be used.

-1/2", for single-layer application in residential construction.

—3/6", lightweight, applied principally in the double wall system over wood framing and in repair and remodel work.

—1/4", a lightweight, low-cost utility gypsum panel, used as base layer for improving sound control in double-layer steel and wood stud partitions and for use over old wall and ceiling surfaces. Also for forming curved surfaces with short radii.

Width: 4 ft.; length: 8, 9, 10, 12 or 14 ft. (except 1/4", available in 8 and 10-ft. lengths only); edges; tapered; finish: natural-finish face paper, suitable for paint or other decoration.

SHEETROCK Brand SW Gypsum Panels have an exclusive easededge design to help minimize ridging or beading and other joint imperfections and help compensate for extremes of temperature and humidity during construction. The system produces the strongest joint ever developed.

This is accomplished by pre-filling gypsum panel joints with DURABOND 90 Joint Compound, a formulation which chemically hardens in about 1½ hours, providing maximum bond and minimum shrinkage. No more compound is required than with regular panels. Taping and other application procedures are conventional.

Except for the rounded edge, SW Panels are tapered like, and otherwise identical to, regular tapered-edge gypsum panels. Made in %", ½" and %" thicknesses.

SHEETROCK Brand FIRECODE "C" Gypsum Panels, made in %" and ½" thicknesses, combine all advantages of regular panels with added resistance to fire exposure; comply with ASTM C36 for type X gypsum board. FIRECODE "C" panels provide improved fire protection as the result of a specially formulated core containing special mineral materials. FIRECODE panels available only in 5%" thickness.

Systems using these gypsum panels have qualified for fire ratings of

Where to use SHEETROCK Brand Gypsum Panels

	(type)→	Reg- ular			FIRECODE	FIRECODE "C"		Foil-Back		Vinyl Panels	W/R Panels†
construction (thickness)→	1/4"	3/8"	1/2&5/8"	5/8"	1/2"	5/8"	3/8"	1/2 & 5/8"	3/8", 1/2" or 5/8"	1/2" & 5/8"
WALLS		-	-		-			-			
Exterior Walls—Single Layer masonry (furred) wood framing rigid insulation board				X X X	×	x	X		X X		X X
Exterior Walls—Double Layer masonry (furred) base finish wood framing base finish		x	x	X X X	X X X	X X X	X X X	x	x x	x	
Interior Walls—Single Layer over existing walls masonry (furred) wood framing metal framing masonry & concrete (direct)		×	x	X X X	X X X	X X X	X X X			×	X X
Interior Walls—Double Layer masonry (furred) base finish wood framing base finish metal framing base finish		×	×	X X X X	x x x x	X X X X	X X X X			x x x	
CEILINGS											
Cellings—Single Layer over existing ceiling wood framing metal framing		X	×	X X	X X	X X	X X	×	X X		
Ceilings—Double Layer wood framing base finish metal framing base finish			X	X X X	x x x	X X X	X X X	x	x x		
Ceilings—Acoustical Base over suspended metal grillag over channel	е			X X	X X	X X	X X				

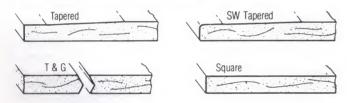
†Recommended as a base for ceramic or other tile.

Gypsum Panels & Accessories SA-927



Pre-filling joints of SHEETROCK Brand SW Gypsum Panels

Gypsum Panel Products—Types of Edges



up to 4 hours in walls, 3 hours in ceilings, 4 hours for column protection. See U.S.G. Construction Selector for tested assemblies.

Limitations (also refer to General Limitations, page 1): (1) In order to attain fire-resistance ratings, the construction of the partition and/or floor and ceiling assemblies must conform to the panel designs as tested at the indicated fire testing facilities (see U.S.G. System Folders). (2) Maximum spacing of frame members: 24" o.c.

Width: 4 ft.; length: 8, 9, 10, 12 or 14 ft.; edges: SW tapered, tapered; finish: natural-finish face paper, suitable for paint, wallpaper or other decoration.

Foil-Back SHEETROCK Brand Gypsum Panels are made by laminating special kraft-backed aluminum foil to back surface of regular, SW, FIRECODE or FIRECODE "C" Panels. Effective as a vapor retarder for walls and ceilings when applied with foil surface next to the framing (1) in single-layer application, or (2) as the base layer in multi-layer systems. Foil-Back Gypsum Panels provide a water vapor retarder to help prevent interior moisture from entering wall and ceiling spaces. In tests per ASTM C355 (desiccant method), ½" foil-back panels showed a vapor permeance of 0.06 perm.

These panels are designed for use with furred masonry, wood or steel framing, except in air conditioned buildings in climates having sustained high outside temperature and humidity. Under these conditions, a qualified mechanical engineer should determine vapor retarder location.

In addition, foil-back panels have an emittance value of 0.05. Use this value in conjunction with the ASHRAE Handbook of Fundamentals for determining the thermal insulation value of a system when the foil faces a plane air space of ½" to 3½". **Limitations:** Not recommended as a base for ceramic or other tile or as base layer for TEXTONE panels in double-layer assemblies. Also not to be used as a base for highly moisture-resistant wall coverings in hot, humid climates such as the Southern Atlantic and Gulf Coast areas. Thickness: ¾", ½" and ½". Sizes, edges and finish: same as for base panels.

SHEETROCK Brand W/R Gypsum Panels are a proven waterresistant base for the adhesive application of ceramic and plastic tile and plastic-faced wall panels. Made water-resistant all the way through: (1) multi-layered face and back paper are chemically treated to combat penetration of moisture; (2) the gypsum core is made water-resistant with a special asphalt composition. The panel is easily

Gypsum Panel Application and Frame Spacing

thickness	approx. panel weight psf	iocation	application method	max. frame spacing o.c.
3⁄8" (1)	1.4	ceilings (3)	perpendicular	16"
3⁄8" (1)	1.4	sidewalls	perpendicular or parallel	16"
1/2"	1.8	ceilings	parallel (3) perpendicular	16" 24" (4)
1/2"	1.8	sidewalls	perpendicular or parallel	24"
5/8"	2.3	ceilings	parallel (3) perpendicular	16" 24"
5/8"	2.3	sidewalls	perpendicular or parallel	24"

(1)For wood framing only. Also see general limitations, page 1.(2)Not recommended below unheated spaces.(3)Not recommended if water-based texturing material is to be applied.(4) Max. spacing 16" if water-based texturing material is to be applied.

Bending of SHEETROCK Brand Gypsum Panels

panei thickness	bending radii with dry panels							
	lengthwise	width						
1/2"	20' (1)	_						
3/8"	71/2'	25'						
1/4"	5'	15'						

(1) Bending two ¼" pieces successively permits radii shown for ¼" thick panels. NOTE: By moistening the face and back paper thoroughly prior to application, and replacing in the stack for at least one hour, the panel may be bent to still shorter radii. When the panel dries thoroughly, it will regain its original hardness.

recognized because of its distinctive green face.

Limitations: adherence to recommendations concerning sealing edges, painting, tile adhesives, framing and installation is necessary for satisfactory performance (see Folder SA-924). Not recommended for ceilings, for resilient attachment where tile is to be applied or in remodeling unless applied directly to studs. Panels should not be installed over a vapor retarder nor on a wall acting as a vapor retarder.

Available in plain core, ½" and 5%" thickness; also in ½" and 5%" SHEETROCK Brand W/R FIRECODE "C" Panels for applications where a fire rating is desired—listed under UL Label Service R-1319-84 with following design numbers applicable: 45-min. U317; 1-hr. U305, U420; 2-hr. U301, U411, U420. Surface burning characteristics: flame spread 20, fuel contributed 5, smoke developed 0. Comply with ASTM C630. Width: 4 ft.; length: 8, 10 or 12 ft.; edges: tapered; finish: green treated paper, suitable for receiving tile, paint or wallpaper.

TEXTONE Panels are conventional gypsum panels with factory-applied vinyl facings in a wide range of coordinated decorator colors. The panels are used for predecorated permanent partitions, movable partitions or in remodeling. See U.S.G. Folder SA-928 for descriptions and specifications.

USG Coreboard has a 1" thick gypsum core encased in strong, gray paper on both sides. It is used in vent shaft and laminated gypsum partitions with additional layers of gypsum panels applied to the coreboard to complete the wall assembly. Manufactured with "V" T&G edges for use in solid partitions or with square edges and prescored 6" to 8" o.c. Coreboard strips are then easily snapped and separated from this master unit. Thickness: 1"; width: 24"; edges: "V" T&G or square; length: 8, 9, 10 and 12 ft. (prescored—7 ft. 8 in. lengths only); finish: gray paper, unsuitable as exposed surface.

USG Shaft Wall Liner has a special gypsum core for added fire resistance and multi-layered green paper facings that are treated to resist moisture penetration. Used in USG Shaft Wall Partitions (see Folder SA-922) and Area Separation Walls (see Folder SA-925). Panels have beveled edges, are 1" thick, 24" wide and are available in lengths up to 16 ft. (14 ft. in some markets).

USG Exterior Gypsum Ceiling Board is a weather- and sag-resistant board designed for use on the soffit side of eaves, canopies and carports and other commercial and residential exterior applications with indirect exposure to the weather. It is noncombustible, is simply scored and snapped for quick application, and offers excellent paintability. Surface burning characteristics: flame spread 20, fuel contributed 5, smoke developed 0. Meets ASTM C931-80.

Installed conventionally in wood and steel-framed soffits; batten strips or mouldings used over butt joints or treated joints; backing strips required for small vent openings. Has beige, water-repellent face paper. Thickness: ½"; widths: 4'; lengths: 8 and 12 ft.; edges: SW tapered. Also available in ½" thick FIRECODE Exterior Ceiling Board. THERMAFIBER Insulation is a mineral fiber product ideal for improving sound control in partition and floor-ceiling constructions. M-S Blankets are designed for insulating exterior furring and steel stud curtain wall assemblies. They are open-faced and require separate vapor retarder. Sound Attenuation Blankets are a paperless, semi-rigid mineral fiber mat designed to improve STC ratings when installed in U.S.G. steel stud partitions and wood-frame construction. Fire-resistant Z-Furring Blankets are used to provide noncombustible exterior wall furring assemblies (see Folder SA-705).

FOAMULAR Polystyrene Insulation, an extruded foam panel, provides exceptional water-resistance for predictable insulating values. Used as insulating sheathing in 1-hour fire-rated, steel or wood-frame exterior walls; as foundation and masonry cavity wall insulation; and in Z-furring systems for insulating exterior walls (see Folder SA-710).

USG Gypsum Sheathing is a fire-resistant gypsum board, ½" thick, with an asphalted gypsum core encased in specially formulated brown water-repellent paper on both sides and long edges. Its weather resistance, water repellence, fire resistance and low applied cost make it suitable for use in exterior curtain wall construction (see Folder SA-805); also a popular choice for wood-framed garden apartments and light commercial building (see U.S.G. Folder SA-924 for application and specifications). Available 24" wide, 8-ft. length with V-shaped T&G long edges and 48" wide, 8 and 9-ft. lengths with square edges. 5%" FIRECODE "C" (type X) board available on special order.

USG Triple-Sealed Gypsum Sheathing is a low-cost structural sheathing for wood frame construction under many exterior finishes—masonry veneer, wood siding and shingles, stucco and composition siding. Triple-sealed with water-repellent paper on face, back and long edges, this fire-resistant gypsum board has untreated core but comes with ends coated with special waterproofing. Easily nailed to studs 16" o.c. (see U.S.G. Folder SA-924 for application and specifications). Available 0.4" thick, 48" wide, 8 and 9-ft. lengths with square edges. GYPLAP Gypsum Sheathing is a weather- and fire-resistant board used in exterior curtain walls (see Folder SA-805) and in frame construction (see Folder SA-924). Lightweight board has noncombustible gypsum core clad in water-repellent paper on face and back surfaces. Available on west coast, ½" thick, 24" wide, 8-ft. length with V-shaped T&G long edges and 48" wide, 8-ft. length with square edges. sheathing limitations

- 1. Sheathing may be stored outside for up to one month, but must be stored off the ground and must have a protective covering.
- 2. Maximum stud spacing is 24 in. o.c.
- 3. When applied to a structure, sheathing must not be left exposed to the elements for more than one month unless the procedure as outlined in limitation 6 (below) is followed.
- 4. Exterior finish systems must be properly caulked for the life of the job, particularly around all cuts.
- 5. Exterior finish systems applied over gypsum sheathing must be applied with mechanical fasteners through the sheathing into the wall framing. Alternate methods of application are not endorsed and their performance is solely the responsibility of the party making the recommendation.
- 6. For curtain wall construction, it is recommended that all gypsum sheathing be covered with No. 15 asphalt felt to assure watertight construction. Asphalt felt should be applied horizontally with 2" overlap

and attached to sheathing. (See SA-805 for curtain wall details.)

7. Use of sheathing for exterior ceilings and soffits is not recommended, except when covered with metal lath and exterior stucco.

2. USG Trim Accessories

Dur-A-Bead is an all-metal hot-dip galvanized steel reinforcement for protecting external corners. It is nailed to framing through gypsum panels and concealed with U.S.G. joint compounds as a smooth, finished corner. Coated with bonding agent for superior joint compound adhesion. Available in three flange widths: **No. 101** 1"x1"; **No. 103** 1¼"x1¼": **No. 104** 1½"x1½".

No. 800 Corner Bead is a galvanized steel external corner reinforcement with 1¼" wide fine-mesh expanded flanges. Nailed to framing through panels or stapled to panels; provides superior key for joint compounds and eliminates shadowing.

USG Control Joint No. 093 is used to relieve stresses of expansion and contraction across the joint in large ceiling and wall areas. Used from floor to ceiling in long partition runs, and from door header to ceiling. Made from roll-formed zinc with a tape-protected ¼" opening 7/16" deep. Lengths: 8 and 10 ft. Limitation: where sound and/or fire ratings are prime considerations, an adequate seal must be provided behind the control joints.

USG Metal Trims provide protection and neat finished edges to gypsum panels at window and door jambs, at ceiling angles and at intersections where panels abut other materials. Easily installed by nailing through the channel and panels into the framing or jamb. Eliminate precision cutting and mitering; joints are simply butted together. Finished with U.S.G. joint compounds (except #400). Made in following types and sizes:

#200 series—steel casing, includes No. 200-A U-shaped channel in $\frac{1}{2}$ " and $\frac{5}{6}$ " sizes; No. 200-B L-shaped angle edge trim without back flange to simplify application, in $\frac{1}{2}$ " and $\frac{5}{6}$ " sizes; No. 200-C L-shaped trim, requires slotted jamb for installation in most cases, open "V" edge of flange inserts into $\frac{1}{6}$ " kerf to make trim adjustable for use with $\frac{3}{6}$ ", $\frac{1}{2}$ " and $\frac{5}{6}$ " gypsum panels.

#400 series—reveal type trim, requires no finishing compound, includes No. 400 in %" size, No. 401 in ½" size, No. 402 in 5%" size. #800 series—expanded-flange trim used to provide edge protection at cased openings and ceilings or wall intersections. Includes 801-A channel-type and 801-B L-shaped trim, both in ½" and 5%" sizes.

USG P-1 Vinyl Trim is a reveal type, white plastic trim with flanges and web of rigid vinyl and integral flexible vinyl fins that compress on installation. Fins form permanent flexible seal to effectively block sound, replace caulking, provide structural stress relief at panel perimeter. Fits tightly over panel edge; requires no finishing compound; paints easily; includes **P-1A** in ½" size, **P-1B** in 5%" size.

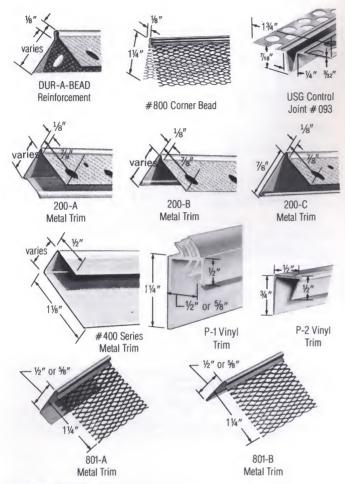
USG P-2 Vinyl Trim is a channel-shaped vinyl trim with a pressuresensitive adhesive backing for attachment to the wall at wall-ceiling intersections. Provides positive perimeter relief in radiant heat ceiling systems. Length: 10 ft.

USG Rigid Vinyl Trim (RP Series) is precision-made of vinyl plastic in solid colors: ivory, tan, chocolate and black. Available for $\frac{1}{2}$ " and $\frac{5}{6}$ " thick panels; lengths: 8, 9, 10 ft.; shapes: RP-2 Inside Corner, RP-4 End Cap, RP-5 Snap-on Corner, RP-7 Snap-on Batten.



USG Rigid Vinyl Trim

Gypsum Panels & Accessories SA-927



USG Trim Accessories

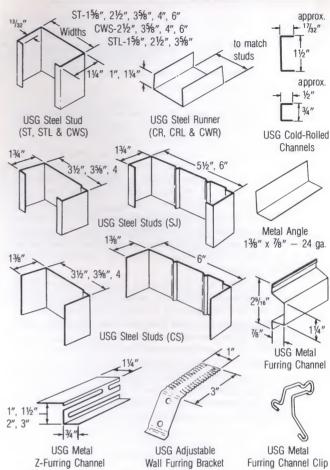
3. Structural Accessories

USG Steel Studs and Runners, channel-type and roll-formed from corrosion-resistant steel, are designed for screw attachment of ½" and %" SHEETROCK Brand Panels and U.S.G. gypsum sheathing. They are strong, non-load bearing components of interior drywall partitions, ceilings and column fireproofing and as framing for exterior curtain wall systems. Heavier thickness studs and runners are used in load-bearing construction. Limited chaseways for electrical and plumbing services are provided by punchouts in the stud web. Assemblies using these studs are low in cost and offer excellent sound and fire-resistance characteristics. Available in various styles and widths to meet functional requirements outlined below:

Interior Partitions, Ceilings, Column Fireproofing—ST and CWS stud styles in four widths—2½", 35%", 4", 6", also ST style in 15%" width—and lengths 8 to 16 ft. Light-duty series STL studs in three widths—15%", 2½", 35%"—and 8 to 12-ft. lengths to match intended function. Runners come in stud widths, 10-ft. length. These items carry a two-part code that identifies the size (212—2½", 358—35%", etc.) and style—ST and CR (25 ga.), CWS and CWR (20 ga.), STL and CRL (26 ga.). For structural properties, see U.S.G. Folder SA-923.

Exterior Curtain Wall—studs are available to meet various height requirements and in six widths—2½", 3½", 35%", 4", 5½", 6"—lengths up to 28 ft. Runners come in stud widths (with 1½" unhemmed leg), 10-ft. lengths. See U.S.G. Folder SA-805 for stud styles, structural and physical properties and limiting heights.

Load-bearing steel studs and runners carry a three-part code that identifies the size (35—3½", 362—35%", etc.) style (SJ—stud/joist, CS-channel stud, CR—C-runner) and steel gauge thickness (see table at right). Items (except ST style) are end color-coded at the factory to



USG Structural Accessories

indicate gauge and help identify products on the job. See U.S.G. folder SA-510 for stud styles, properties and load tables.

USG Metal Angles are 13/6"x7/6"x24-ga. galvanized steel angle sections used as runners to secure and brace 1" coreboard in laminated gypsum partitions. Length: 10 ft.

USG Metal Furring Channels are ceiling and wall channels made of galvanized steel designed for screw-attachment of ½" and %" gypsum panels. Face width: 1¼"; depth: ½"; length: 12 ft.

USG Furring Channel Clips are made of galvanized wire and used in attaching Metal Furring Channels to 11/2'' cold-rolled runner channels. They are installed on alternate sides of the carrying channels; where clips cannot be alternated, wire tying is recommended.

USG Z-Furring Channels are used to mechanically attach rigid insulation board or Z-furring blankets and SHEETROCK Brand Panels to interior surfaces of monolithic concrete and masonry walls (see U.S.G. Folder SA-923). Also highly effective for attaching insulation and

thickness-steel studs and runners (1)

	design (2)		minimum		end color
in	mm	in	mm	gauge (3)	code
0.0168	0.43	0.0160	0.41	26	pink
0.0188	0.48	0.0179	0.45	25	none
0.0299	0.76	0.0284	0.72	22	blue
0.0344	0.87	0.0329	0.84	20	white
0.0359	0.91	0.0341	0.87	20	white
0.0478	1.21	0.0454	1.15	18	yellow
0.0598	1.52	0.0568	1.44	16	green
0.0747	1.90	0.0710	1.80	14	orange
	in 0.0168 0.0188 0.0299 0.0344 0.0359 0.0478 0.0598	in mm 0.0168 0.43 0.0188 0.48 0.0299 0.76 0.0344 0.89 0.0359 0.91 0.0478 1.21 0.0598 1.52	in mm in 0.0168 0.43 0.0160 0.0188 0.48 0.0179 0.0299 0.76 0.0284 0.0344 0.87 0.0329 0.0359 0.91 0.0341 0.0478 1.21 0.0454 0.0598 1.52 0.0568	in mm in mm 0.0168 0.43 0.0160 0.41 0.0188 0.48 0.0179 0.45 0.0299 0.76 0.0284 0.72 0.0344 0.87 0.0329 0.84 0.0359 0.91 0.0341 0.87 0.0478 1.21 0.0454 1.15 0.0588 1.52 0.0568 1.44	in mm in mm gauge (3) 0.0168 0.43 0.0160 0.41 26 0.0188 0.48 0.0179 0.45 25 0.0299 0.76 0.0284 0.72 22 0.0344 0.87 0.0329 0.84 20 0.0359 0.91 0.0341 0.87 20 0.0478 1.21 0.0454 1.15 18 0.0598 1.52 0.0568 1.44 16

(1) Uncoated steel thickness; meets ASTM A568. Studs meet ASTM C645 except STL series. Min. yield strength 33 ksi, except SJ and CS studs 40 ksi. Coatings are hot-dip galvanized per ASTM A525; aluminized per ASTM A463, or 55% aluminum-zinc. (2) Conforms to AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition. (3) For information only; refer to limiting height tables and structural properties for design data.

gypsum panels to interiors of existing walls and ceilings. Made of hot-dip galvanized steel; furring depths: 1", 1½", 2", 3"; length: 8'-6". **USG Adjustable Wall Furring Brackets** are used in braced furring systems for exterior masonry walls. Made of 20-ga. galvanized steel with corrugated edges, they are screw-attached to USG Steel Studs; fur out panels up to 2½" plus stud width.

USG Cold-Rolled Channels, made of 16-ga. steel, are used for furring, and in suspended ceilings and partition constructions. Available either galvanized or black asphaltum painted. Sizes: $\frac{3}{4}$ ", with $\frac{1}{2}$ " flange; $\frac{1}{2}$ " with $\frac{1}{2}$ " flange. Length: 16 and 20 ft.

RC-1 Resilient Channel is a galvanized steel channel which provides for resilient attachment of gypsum panels to wood framing. Widely used to improve sound transmission loss in partitions and ceilings of garden-type apartments, motels and other structures (see U.S.G. Construction Selector). Prepunched holes in the flange facilitate screw fastening to framing members; panels are attached to channel with USG Type S Screws. Width: 2½"; depth: ½"; length: 12 ft. Limitation: not for use beneath highly flexible floor joists; should be attached to ceilings only with 1½" USG Type W or S screws; see Wood Framing Requirements, page 9.

Note: Refer to Notes to Architect, page 10, for recommendations concerning protection of light-gauge metal components in marine areas where corrosive elements are present in the atmosphere.

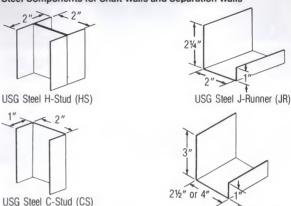
USG Steel Components for Shaft Walls and Area Separation Walls are formed from corrosion-resistant steel, with base metal meeting structural performance standards in ASTM A446 Grade C, except C-H Stud Grade A (see U.S.G. Folders SA-922 and SA-925). Items are end color-coded to indicate thickness as follows: 25 ga. black; 24 ga. red; 22 ga. blue; 20 ga. white; 18 ga. yellow; 16 ga. green. Two groups: Cavity Wall Components are made from galvanized steel for use with 1" thick USG Shaft Wall Liner. USG Steel J-Runners used at floor and ceiling and for elevator door framing, made with unequal legs in 21/2", 4" and 6" widths; styles: 212JR24, 212JR20, 400JR24, 400JR20, 600JR24, 600JR20; length: 10 ft. USG Steel C-H Studs are rigid, roll-formed sections shaped to engage 1" liner panels. Widths: 21/2" and 4"; styles: 212CH25, 212CH22, 400CH25, 400CH20; lengths as required. USG Steel E-Studs are used singly to cap partition or both sides of closure panel; widths: 21/2", 4" and 6"; styles: 212ES25, 212ES20, 400ES25, 400ES20, 600ES25, 600ES20; lengths as required. USG Steel J-Struts are used in jamb framing for fire-rated elevator doors. Widths: 21/2" and 4": style: 212JS20, 400JS20; lengths as required.

Solid Wall Components are made for use with two thicknesses of 1" thick Shaft Wall Liner in Area Separation Walls. USG Steel J-Runners are used at floor and ceiling, back-to-back between liner panels at intermediate floors and as jambs and terminals. Width: 2"; style: 200JR24; length: 10 ft. USG Steel H-Studs slide over and engage edges of adjacent liner panels. Width: 2"; styles: 200HS24, 200HS22, 200HS20, 200HS18, 200HS16; length: 8 to 16 ft. USG Steel C-Studs are used singly to cap partition or back-to-back both sides of closure panels. Width, styles and length same as for H-Studs.

USG Direct Suspension System is a direct-hung steel ceiling grid for screw application of gypsum panels in commercial and industrial buildings. This modular system consists of simple, fast-erecting, snap-lock parts. Main Beam MB-12 standard heavy-duty tee beam

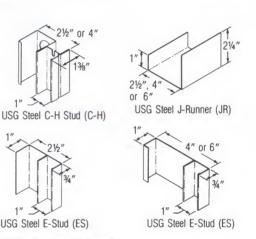


Steel Components for Shaft Walls and Separation Walls

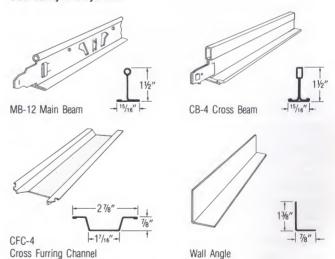


USG Steel J-Strut (JS)

USG Solid Wall Systems



USG Cavity Wall Systems



USG Direct Suspension System

prepunched for intersecting components; splices without clips or plates. Length: 12 ft. Cross Furring Channel CFC-4 simply locks into main beam. Knurled surface and 25-ga. steel speed screw penetration. Length: 4 ft. Cross Beam CB-4 supports edge of standard 2x4 ft. lighting fixtures. Length: 4 ft. Wall Angle supports Cross Furring Channels, provides backup for gypsum panels at wall. Length: 10 ft.

Gypsum Panels & Accessories SA-927

Fastening Application	Fastener Used
GYPSUM PANELS TO STEEL FRAMING (1)	
/2" single layer panels to steel	7/8"Type S Bugle Head
studs, runners, channels	- intuities
%" single layer panels to steel	1" Type S Bugle Head
studs, runners, channels. Specify cadmium-plated screws to attach gypsum sheathing in curtain walls	Junuani.
%" single layer panels to	11/8" Type S Bugle Head
RC-1 channels Batten strips to steel studs in Demountable partitions	- intrintint
1" coreboard to metal angle runners in solid partitions	11/4" Type S Bugle Head
ULTRAWALL Panels to studs and runners	1¼" Type S Bugle Hea Cadmium Plate
½" double layer panels to steel	η 15/ ₁₆ " Type S Bugle Hea
studs, runners, channels	
%" double layer panels to steel studs, runners, channels	15%" Type S Bugle Hea
1/2" panels through coreboard	1%" Type S Bugle Hea
to metal angle runners in solid partitions	
%" panels through coreboard to metal angle runners in solid partitions. Also available in 25%" and 3" lengths	21/4" Type S Bugle Hea
GYPSUM PANELS TO 12-GA. (MAX.) STEEL	FRAMING (1)
1/2" and %" panels and gypsum sheathing to steel studs and runners. Specify cadmium-plated screws to	1" Type S-12 Bugle Hea Also available in 11/4" lengt
attach gypsum sheathing in curtain walls	minimi
	e S-12 Pancake Head Cadmium Plate
and brick wall ties through gypsum sheathing to steel studs and runners in curtain walls	Also available in Type
1// and 5// double lover gyroum	15/6" Type S-12 Bugle Hea
1/2" and %" double layer gypsum panels to steel studs and runners	Philippi S-12 Bagie nea
Multi-layer gypsum panels to	1%" Type S-12 Bugle Hea
steel studs and runners Also available in 2", 2%", 25%" and 3" lengths	
RIGID FOAM INSULATION TO 12-GA. (MAX.)	STEEL FRAMING
Rigid foam insulation panels to steel studs and runners	2" Type S-12 Wafer Hea
Also available in 1½", 2½" and 3" length and Type R for 25-ga. steel	
WOOD TRIM TO INTERIOR STEEL FRAMING	i
Wood trim over single layer panels	15%" Type S Trim Hea
to steel studs, runners. Also available in 1" length and Type S-12	
Wood trim over double	21/4" Type S Trim Hea
layer panels to	

Fastening Application	Fastener Used
STEEL STUDS TO DOOR FRAMES, RUNNE	RS
Steel studs to runners	3/8" Type S Pan Hear
	ann
Steel studs to door frame jamb anchor clips Steel studs to runner	%" Type S-12 Pan Head Also available in ½" lengtl
Other metal-to-metal attachment 12-ga. max.)	
Steel studs to door frame jamb anchor clips (heavier shank assures	%" Type S-12 Low-Profile Head
entry in clips of hard steel) Steel studs to runner; other metal-to-metal attachment (suitable for double thickness 14-ga.)	
Strut studs to door frame clips, rails, other attachments in ULTRAWALL	½" Type S-16 Pan Hea Cadmium Plate
movable partitions	
Steel-to-steel connections up to double thickness 12-ga.	34" Type S-4 Hex Washer Hea Cadium Plate
TRIM AND ACCESSORIES TO STEEL FRAM	MING
Door hinges and trim to door frame Aluminum trim to steel framing	%" Finishing Screw Type S-1 Oval Head Cadmium Plate
(screw matches hardware and trim)	
(screw matches hardware and trim) Cabinets to steel studs and	11/4" Type S Oval Hea
(screw matches hardware and trim) Cabinets to steel studs and	11/4" Type S Oval Hea
(screw matches hardware and trim) Cabinets to steel studs and resilient channels Also a	1½" Type S Oval Heavailable in 156", 2½", 276" and 3¾" leng
(screw matches hardware and trim) Cabinets to steel studs and resilient channels Also a	1½" Type S Oval Heavailable in 156", 2½", 276" and 3¾" leng
(screw matches hardware and trim) Cabinets to steel studs and resilient channels Also a GYPSUM PANELS TO WOOD FRAMING 3/6", 1/2" and 5/6" single layer panels	1½" Type S Oval Heavailable in 156", 2½", 276" and 3¾" leng
(screw matches hardware and trim) Cabinets to steel studs and resilient channels Also a GYPSUM PANELS TO WOOD FRAMING 3/6", 1/2" and 5/6" single layer panels	11/4" Type S Oval Hea available in 15/6", 21/4", 27/6" and 33/4" leng
Cabinets to steel studs and resilient channels GYPSUM PANELS TO WOOD FRAMING 3/6", 1/2" and 5/6" single layer panels to wood framing	11/4" Type S Oval Heavailable in 15%", 21/4", 27%" and 334" leng 11/4" Type W Bugle Heavailable 11/4" Type W, 76" or 1" Type
(screw matches hardware and trim) Cabinets to steel studs and resilient channels Also a GYPSUM PANELS TO WOOD FRAMING 3%", 1/2" and 5%" single layer panels to wood framing RC-1 RESILIENT CHANNEL TO WOOD FRAMING Screw attachment required for ceiling,	11/4" Type S Oval Heavailable in 15%", 21/4", 27%" and 334" leng 11/4" Type W Bugle Heavailable 11/4" Type W, 16" or 1" Type Bugle Head (see details above)
Cabinets to steel studs and resilient channels GYPSUM PANELS TO WOOD FRAMING %", ½" and %" single layer panels to wood framing RC-1 RESILIENT CHANNEL TO WOOD FR. Screw attachment required for ceiling, recommended for partitions	11/4" Type S Oval Heavailable in 15%", 21/4", 27%" and 334" leng 11/4" Type W Bugle Heavailable 11/4" Type W, 16" or 1" Type Bugle Head (see details above)
Cabinets to steel studs and resilient channels GYPSUM PANELS TO WOOD FRAMING 3/6", 1/2" and 5/6" single layer panels to wood framing RC-1 RESILIENT CHANNEL TO WOOD FRAMING Screw attachment required for ceiling, recommended for partitions For fire-rated construction	11/4" Type S Oval Heavailable in 15/6", 21/4", 27/6" and 33/4" leng 11/4" Type W Bugle Heavailable 11/4" Type W, 7/6" or 1" Type Bugle Head (see details abov 11/4" Type S Bugle Heavailable (see detail at le
Cabinets to steel studs and resilient channels Also a GYPSUM PANELS TO WOOD FRAMING %", ½" and %" single layer panels to wood framing RC-1 RESILIENT CHANNEL TO WOOD FRAMING Screw attachment required for ceiling, recommended for partitions For fire-rated construction GYPSUM PANELS TO GYPSUM PANELS Multi-layer adhesively laminated gypsum to gypsum partitions (not recommended for double layer %" panels)	11/4" Type S Oval Heavailable in 15/6", 21/4", 27/6" and 33/4" leng 11/4" Type W Bugle Heavailable 11/4" Type W, 7/6" or 1" Type Bugle Head (see details abov 11/4" Type S Bugle Heavailable (see detail at le
Cabinets to steel studs and resilient channels Also a GYPSUM PANELS TO WOOD FRAMING W", 1/2" and %" single layer panels to wood framing RC-1 RESILIENT CHANNEL TO WOOD FRAMING Screw attachment required for ceiling, recommended for partitions For fire-rated construction GYPSUM PANELS TO GYPSUM PANELS Multi-layer adhesively laminated gypsum to gypsum partitions (not recommended for double layer %" panels) PLYWOOD TO STEEL JOISTS	11/4" Type S Oval Heavailable in 15%", 21/4", 27%" and 334" leng 11/4" Type W Bugle Heavailable 11/4" Type W, 76" or 1" Type Bugle Head (see details abov 11/4" Type S Bugle Heavailable (see detail at le
Cabinets to steel studs and resilient channels Also a GYPSUM PANELS TO WOOD FRAMING "", 1/2" and %" single layer panels to wood framing RC-1 RESILIENT CHANNEL TO WOOD FRAMING Screw attachment required for ceiling, recommended for partitions For fire-rated construction GYPSUM PANELS TO GYPSUM PANELS Multi-layer adhesively laminated gypsum to gypsum partitions (not recommended for double layer %" panels) PLYWOOD TO STEEL JOISTS "" to 3/" plywood to light steel joists (penetrates double	11/4" Type S Oval Heavailable in 15%", 21/4", 27%" and 334" leng 11/4" Type W Bugle Heavailable 11/4" Type W, 76" or 1" Type Bugle Head (see details abov 11/4" Type S Bugle Heavailable (see detail at le
Cabinets to steel studs and resilient channels GYPSUM PANELS TO WOOD FRAMING W", 1/2" and %" single layer panels to wood framing RC-1 RESILIENT CHANNEL TO WOOD FRAMING Screw attachment required for ceiling, recommended for partitions For fire-rated construction GYPSUM PANELS TO GYPSUM PANELS Multi-layer adhesively laminated gypsum to gypsum partitions (not recommended for double layer %" panels) PLYWOOD TO STEEL JOISTS W" to 34" plywood to light steel joists	11/4" Type S Oval Heavailable in 15%", 21/4", 27%" and 334" leng 11/4" Type W Bugle Heavailable 11/4" Type W, 76" or 1" Type Bugle Head (see details abov 11/4" Type S Bugle Heavailable (see detail at le
Cabinets to steel studs and resilient channels Also a GYPSUM PANELS TO WOOD FRAMING "", 1/2" and %" single layer panels to wood framing RC-1 RESILIENT CHANNEL TO WOOD FRAMING Screw attachment required for ceiling, recommended for partitions For fire-rated construction GYPSUM PANELS TO GYPSUM PANELS Multi-layer adhesively laminated gypsum to gypsum partitions (not recommended for double layer %" panels) PLYWOOD TO STEEL JOISTS "" to 3/" plywood to light steel joists (penetrates double	11/4" Type S Oval Hea available in 15/6", 21/4", 27/6" and 33/4" length
Cabinets to steel studs and resilient channels Also a GYPSUM PANELS TO WOOD FRAMING "", "/=" and %" single layer panels to wood framing RC-1 RESILIENT CHANNEL TO WOOD FRAMING Screw attachment required for ceiling, recommended for partitions For fire-rated construction GYPSUM PANELS TO GYPSUM PANELS Multi-layer adhesively laminated gypsum to gypsum partitions (not recommended for double layer %" panels) PLYWOOD TO STEEL JOISTS "" to "" plywood to light steel joists (penetrates double thickness 14-ga.)	AMING 11/4" Type W Bugle Heat 11/4" Type W, 7/6" or 1" Type Bugle Head (see details abov 11/4" Type S Bugle Heat (see detail at let)

Notes: (1) Includes USG Steel Studs and Runners, ST, STL and CWS styles; Metal Angle Runners; Metal Furring Channels; RC-1 Resilient Channels. If channel resiliency makes screw penetration difficult, use screws 1/2" longer than shown to attach panels to RC-1 channels. For other gauges of studs and runners, always use Type S-12 screws. For steel applications not shown, select a screw length which is at least 1/4" longer than total thickness of materials to be fastened. USG Screws are manufactured under U.S. Patent Nos. 3,207,023; 3,221,558; 3,204,442; 3,260,100.



Spreader application of adhesive

4. USG Screws, Adhesives and Sealants

USG Screws are aimed at producing the best possible attachments of SHEETROCK Brand Gypsum Panels. Their development not only has improved installation methods but has made possible today's broad selection of drywall systems applied over steel framing. Screws must be used with such systems.

The superior holding power of drywall screws has virtually eliminated loose panel attachment and consequent problems of "nail pops" in wood frame construction. Fewer screws than nails are generally required, and speed of installation compares favorably with nailing when electric screwguns are used. Fracturing of the gypsum core and damage to face paper are minimized. Tests have shown USG Type W Screws to have 350% greater withdrawal resistance than GWB-54 nails.

Today's complete U.S.G. line of self-drilling, self-tapping steel screws includes types with a double lead thread design which produces up to 30% faster penetration, less screw stripping, and greater holding power than conventional fasteners. Comply with ASTM C646. Super-Tite Screws are high quality, economical screws for interior framing applications. These self-drilling, self-tapping steel screws have specially designed drill point and threads to assure fast penetration into steel and wood framing. Sizes available: 1", 11/8", 11/4", 15/8", 21/4", 3" Bugle Head for attaching gypsum panels to 20 and 25-ga. steel framing; 11/4" W Bugle Head for attaching panels to wood framing; 7/16" Pan Head for securing studs to runners. Comply with ASTM C646.

Drywall Adhesives make an important contribution to gypsum panel attachment where the finest room interiors are desired. Their use greatly reduces the nail or screw fastening otherwise required, thus saves labor on spotting and sanding—also minimizes nail pops and other fastener imperfections.

Recommended for laminating gypsum panels in multi-layer firerated or non-rated partitions and ceilings are **Durabond Joint Compounds**—dry powder products, applied by spreader, requiring mixing and temporary fastening in application or **USG Ready-Mixed Joint Compound**—All Purpose or Taping. Provide tight bond when dry yet permit adjustment of panels after contact.

Commercially available adhesives in drywall stud, laminating, liquid contact and construction types are used in non-fire rated gypsum construction. These adhesives bridge minor irregularities in the base or framing, make it easier to form true joints and level surfaces. The use of adhesive adds strength to an assembly, reduces fasteners required, helps eliminate loose panels and nail pops.

USG Acoustical Sealant is a highly elastic, water-base caulking for sound-rated partition and ceiling systems and sealing exterior walls to reduce infiltration. Non-bleeding and staining, pumpable and easily

applied in beads. Provides excellent adherence to most surfaces, permanent flexibility and lasting seal.

Also available is **SHEETROCK Brand W/R Compound** used to treat joints and applied to all cut edges and nail heads of special Water-Resistant Gypsum Panels used in high-moisture room areas to protect the gypsum core from moisture penetration.

For complete application specifications, see pertinent U.S.G. System Folders and adhesive manufacturer's directions.

5. Joint Treatment and Texture Products

Today's complete U.S.G. joint treatment line includes both ready-mixed and powder products in drying and hardening types. All are formulated without asbestos to meet OSHA and Consumer Product Safety standard pertaining to asbestos. In addition to conventional joint finishing and fastener spotting, certain of these products are designed for repairing cracks, patching, spackling, back-blocking, texturing and for laminating gypsum panels in double-layer systems. These products meet ASTM C475-64 and Federal Specification SS-J-570B—Type I.

U.S.G. also produces the industry's broadest line of texture finishes to provide distinctive appearance and surface decoration to gypsum panel walls and ceilings. A full line of both ready-to-use and powder products are offered to create fine, medium or coarse textures, sand or simulated acoustical finishes and interesting flat ripple, "orange peel" or light to medium stipples. For available texture products, often applied by the same trade which finishes gypsum drywall, refer to USG Texture and Paint Products Folder SA-933.

general limitations

- 1. U.S.G. joint compounds are not compatible with and should not be intermixed with any other compounds.
- 2. For interior use only (except DURABOND Compounds); not recommended for laminating (except DURABOND Compounds and USG Ready-Mixed Compounds—All Purpose and Taping).
- 3. Protect bagged and cartoned products against wetting; protect ready-mixed products from freezing and extreme heat.
- **4.** Each compound coat must be dry before the next is applied (except DURABOND Compounds), and completed joint treatment must be thoroughly dry before decorating.
- 5. U.S.G. joint compounds are not recommended for treating joints of Water-Resistant Gypsum Panels to be covered with ceramic or plastic tile (use Sheetrock Brand W/R Compound).

PERF-A-TAPE Reinforcing Tape is a strong, cross-fibered paper tape with minimal longitudinal stretch and superior tensile strength. Lightly pre-creased for corner application. For estimating purposes; for 1,000 sq.ft. of surface area to be finished, approximately 370 lin. ft. of tape and 83 lb. of powder-type or 138 lb. of ready-mixed type joint compound are required.

Ready-Mixed Compounds

USG Ready-Mixed Joint Compounds are vastly superior to ordinary ready-mixed compounds and are preferred for consistently high-quality work. These non-asbestos vinyl-based formulations are specially premixed to a creamy, smooth consistency essentially free of crater-causing air bubbles. They offer excellent slip and bond, easy workability. Used direct from the container without mixing, thinning or retempering. Available in either regular, hand or tool consistency; on-the-wall cost averages the same as with powder compounds. Limitation: must protect wet joints and container from freezing.

USG Ready-Mixed Joint Compound-Taping is a high-performance product for embedding tape and as a first fill coat over metal bead, trim and fasteners. Also used for laminating.

USG Ready-Mixed Joint Compound-Topping is a low-shrinkage, easily applied and sanded product recommended for second and third coats over USG Ready-Mixed Taping and All Purpose Compounds. Also used for simple texturing or skim coating. Not suitable for embedding tape or as first coat over metal corners, trim and fasteners.

USG Ready-Mixed Joint Compound-All Purpose, used for embedding, finishing, simple texturing and for laminating. Combine single-package convenience with good taping and topping characteristics. Recommended for finishing Sheetrack Brand SW Gypsum Panel joints over Durabond Compound; also for repairing cracks in interior plaster and masonry not subject to moisture.

Vinyl-Base Powder Joint Compounds

USG Powder Joint Compounds are top-quality, non-asbestos, conventionally drying products providing easy mixing, smooth application and ample working time. Designed for embedding tape; for fill coats and finishing over drywall joints, corner bead, trim and fasteners. Also used for simple texture finishes for decorating variety; will not cause alkali burning of paint.

USG Joint Compound-Taping is designed for embedding tape and for first fill coat on metal beads, trim and fasteners; also used for patching plaster cracks. Outstanding bond and resistance to tape cracking.

USG Joint Compound-Topping is a smooth-sanding material for second and third coats over taping compound or all-purpose compound. Produces excellent feathering and superior finishing results. **USG Joint Compound-All Purpose** incorporates good taping and topping characteristics in a single product, for use where finest results of the specialized compounds (above) are not necessary. Also has good texturing properties.

DURABOND Joint Compounds

These hardening-type powder products were developed to provide faster finishing of drywall interiors, even under slow drying conditions. Rapid chemical hardening and low shrinkage permit same-day finishing and usually next-day decoration. Features exceptional bond; virtually unaffected by humidity extremes. Ideal for laminating double-layer systems, particularly fire-rated assemblies, and for adhering gypsum panels to sound deadening boards and to abovegrade concrete surfaces. Excellent for skim coating and surface texturing and for filling, smoothing and finishing interior above-grade concrete. Also used to treat joints in exterior gypsum ceiling board and to embed tape and fill beads in veneer finish systems when rapid drying conditions exist. Limitations: DURABOND Compounds are difficult to sand after drying and must be smoothed before complete hardening. Not to be applied over moist surfaces or surfaces likely to become moist, on below-grade surfaces, or on other surfaces subject to moisture exposure, pitting or popping.

DURABOND 210 Joint Compound is preferred for embedding tape and

metal accessories; also ideal for heavy fills because it chemically hardens in 3 to 6 hours. Virtually unaffected by humidity.

DURABOND 90 Joint Compound with a 1 to 2-hour hardening time is an ideal alternate to DURABOND 210 Joint Compound in applications where quicker finishing or laminating are desired. Required as prefill material for SW Gypsum Panels. Also used extensively for touch-up and patching; ideal for filling offsets and voids in poured concrete. **DURABOND 45, 150 and 300 Joint Compounds** offer a variety in setting times of approx. 30 to 60 min., 120 to 180 min. and 240 to 360 min.

Concrete Finishing Compound

COVER COAT Compound is a vinyl-base product, designed for filling and smoothing monolithic concrete ceilings and columns located above grade—no extra bonding agent needed. Supplied in ready-mixed form (sand can be added), easily applied with drywall tools in two or more coats. Dries to a fine white surface usually making further decoration unnecessary on ceilings. **Limitations:** not to be applied over moist surfaces or surfaces likely to become moist (by condensation or otherwise); on ceiling areas below grade; on surfaces which project outside the building, or on other areas which might be subject to moisture, freezing, efflorescence, pitting or popping.

wood framing requirements

Wood framing meeting the following minimum requirements is necessary for proper performance of all gypsum panel assemblies.

- Framework should meet the minimum requirements of HUD/FHA, American Softwood Lumber Standard and local building codes.
- 2. Framing members should be straight, true, of uniform dimension, and framing should be properly aligned.
- 3. All framing lumber should be of a good grade for the intended use, and 2"x4" nominal size or larger should bear the grade mark of a recognized inspection agency.
- 4. All framing lumber should have a moisture content not in excess of 15% at time of gypsum panel application.
- 5. Do not attach gypsum panels to extremely soft framing members.

Failure to observe these minimum framing requirements, which are applicable to screw, nail and adhesive attachment, will materially increase the possibility of fastener failure and surface distortion, due to warping or dimensional changes. This is particularly true if framing lumber has greater than normal tendencies to warp or shrink after erection.

heating and ventilation recommendations

Framing should approach as closely as possible the moisture content it will reach in service by allowing the building, after it is enclosed, to stand as long as possible prior to the application of the gypsum panels. Provide heat in winter or during damp conditions at a uniform temperature in the range of 55° to 70°F. Provide ventilation to remove excess moisture.











general drywall specifications

notes to architect

1. Specifications—Following comments and recommendations cover basic specifications for normal job requirements, and are intended as minimum guide specifications which can be adapted to specific projects and conditions. These specifications are not intended to cover every possible design or job condition, but rather to assist in preparation of specifications for a given project.

2. Related Systems—Description, details and specifications on the various drywall systems are covered in pertinent U.S.G. System Folders in this series and in Sweet's General Building File:

Steel Framing Systems	SA-510
Exterior Curtain Walls	SA-805
Cavity Shaft Walls	SA-922
Steel-Framed Drywall Systems	SA-923
Drywall/Wood Frame Systems	SA-924
Area Separation Walls	SA-925

- 3. Protection—Light gauge metal components such as steel studs and runners, furring channels and resilient channels should be given adequate protection in the warehouse and on the jobsite against rusting caused by moisture. In marine areas such as the Caribbean, Florida and the Gulf Coast where chloride as well as sea salt is present in combination with excessively high humidity, use of components which offer increased protection against corrosion is recommended.
- 4. Shadowing—Temperature differentials on the interior surface of exterior walls may result in collection of dust on the colder surface areas. Consequently, shadowing (accumulated dust) may occur at locations of fasteners or furring channels where surface temperatures usually are lowest. United States Gypsum cannot be held responsible for surface discoloration of this nature. Where temperature, humidity and soiling conditions are expected to cause objectionable blemishes, use free standing furring with insulation against the exterior wall.
- 5. Note—United States Gypsum reserves the right to make changes or improvements in the design of all catalogued items without notice and without obligation to incorporate these changes or improvements in items already manufactured.
- **6.** Additional Information—See U.S.G. technical folders in this series and in Sweet's General Building File; Construction Selector SA-100 for fire and sound-rated systems; Textone Gypsum Panels SA-928 for vinyl-surfaced panel colors and patterns; Texture and Paint Products SA-933 for finishing product specifications; Building & Acoustical Insulation SA-705 for insulation specifications; FOAMULAR Insulation SA-710 for data on rigid polystyrene insulation.

Part 1: general

1.1 scope—Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

In cold weather and during gypsum panel joint finishing, temperatures within the building shall be maintained within the range of 55° to 70°F. (13° to 21°C). Adequate ventilation shall be provided to carry off excess moisture.

Part 2: products

2.1 materials

a. Gypsum Panels (in lengths as long as practical to minimize number of joints):

SHEETROCK Brand (Regular, SW, FIRECODE, FIRECODE "C", Foil-Back) Gypsum Panels (thickness).

TEXTONE Vinyl-Faced Gypsum Panels (type) (color or pattern) (thickness).

SHEETROCK Brand W/R (FIRECODE "C") Gypsum Panels (type) (thickness).

b. Gypsum Coreboard: USG Coreboard (length).

c. Gypsum Sheathing: (USG Gypsum Sheathing, USG Triple-Sealed Gypsum Sheathing, GYP-LAP Gypsum Sheathing) (size).

d. Exterior Ceiling Board: USG Exterior Gypsum Ceiling Board.

e. Corner Reinforcement: (DUR-A-BEAD No. 101, 103, 104) (No. 800).

f. Metal Trim: USG Metal Trim No. (200-A ½" or 5%", 200-B ½" or 5%", 200-C, 400, 401 or 402, 801-A ½" or 5%", 801-B ½" or 5%").

g. Plastic Trim: USG (P-1) (P-2) (RP Series), Viniyl Trim.

h. Resilient Channels: RC-1 Resilient Channel.

i. Steel Studs: USG Steel Studs (style) (length).

j. Steel Runners: USG Steel Runners (style) (length).

k. USG Direct Suspension System: Main Beam MB-12, Cross Furring Channel CFC-4, Cross Beam CB-4, Wall Angle.

I. Metal Furring Materials: (USG Metal Furring Channels and Clips) (USG Adjustable Wall Furring Brackets) (USG Cold-Rolled Channels ¾" or 1½") (USG Z-Furring Channels).

m. Drywall Screws: (length) USG Screw Type (S, S-12, S-16, S-18, R, W or G), SUPER-TITE Screws.

n. Drywall Nails: (length) (type) (USG Matching Color Nails to match finish of TEXTONE Vinyl Panels) (conforming with "Recommended Performance Standards for Nails for Gypsum Wallboard", adopted by Gypsum Association and the AWCI (as specified in fire-resistive construction.)

o. Control Joint: USG Control Joint No. 093.

p. Drywall Adhesives: (DURABOND Joint Compound 210 or 90.) (USG Ready-Mixed Joint Compound—All Purpose or Taping).

 ${\bf q.~W/R~Compound:}$ (for W/R Gypsum Panels) SHEETROCK Brand W/R Compound.

r. Joint Treatment: PERF-A-TAPE Reinforcing Tape. DURABOND Joint Compound (45, 90, 150, 210, 300). USG Joint Compound (Taping, Topping, All Purpose).

USG Ready-Mixed Joint Compound (Taping, Topping, All Purpose).

s. Caulking: USG Acoustical Sealant.

t. Concrete Finishing Compound: (DURABOND Joint Compound) (COVER COAT Drywall Compound) (as ready-mixed) (with sand additive).

u. Cavity Shaft Wall Materials: USG Shaft Wall Liner, USG Steel J-Runners (style), USG Steel C-H Studs (style), USG Steel E-Studs (style), USG Steel J-Struts (style).

v. Cavity-type Area Separation Wall Materials: USG Gypsum Liner Panels, USG Steel J-Runners (style), USG Steel C-H Studs and E-Studs (style).

w. Solid-type Area Separation Wall Materials: USG Gypsum Liner Panels, USG Steel J-Runners (style), USG Steel H-Studs and C-Studs (style).

Part 3: execution

3.1 gypsum panel application

3.1.1 basic single-layer system, treated joints

a. Position all ends and edges of all gypsum panels over framing members, except when joints are at right angles to framing members as in perpendicular application or when end joints are backblocked.

- b. Apply gypsum panels first to the ceiling and then to the walls. Extend ceiling board into corners and make firm contact with top plate. To minimize end joints, use panels of maximum practical lengths. Fit ends and edges closely, but not forced together. Stagger end joints in successive courses with joints on opposite sides of a partition placed on different studs.
- c. Attach panels to framing supports by: (Standard Single Nailing Method) (Adhesive Application) (Double Nailing Method) (Powerdriven USG Screws). Space fasteners not less than 3/6" from edges and ends of panels and drive as recommended for specified fastening method. Drive fasteners in field of panels first, working toward ends and edges. Hold panel in firm contact with framing while driving fasteners. Drive fastener, heads slightly below surface of gypsum panels in a uniform dimple without breaking face paper.
- d. Cut ends, edges, scribe or make cutouts within field of panels in a workmanlike manner.
- e. Install trim at all internal and external angles formed by the intersection of either panel surfaces or other surfaces. Apply corner bead to all vertical or horizontal external corners in accordance with manufacturer's directions.

(Multi-layer systems: see pertinent U.S.G. System Folders).

3.1.2 SHEETROCK Brand W/R Panels—(see U.S.G. Folder SA-924).

3.1.3 lamination of SHEETROCK Brand Gypsum Panels to interior monolithic concrete and unit masonry

- a. The masonry or concrete shall be clean, smooth and dry prior to application. If wood base is to be used, attach wood nailer to wall before lamination is started.
- **b.** Cut face panels to allow continuous clearance (1/8" to 1/4") at floor. Apply Durabond Joint Compound, USG Ready-Mixed Joint Compound—All Purpose or Taping at center and near each panel edge in strips consisting of 4 beads, 3/8" wide x 1/2" high and spaced 11/2" to 2" o.c. Position panels vertically over wall surface, press into place and provide temporary support until adhesive is hardened.
- c. Install trim at all intersections of panel surfaces with other surfaces.
- d. Lamination to interiors below grade or directly to interior surfaces of exterior walls, and lamination where exposure to moisture is extreme or continuous, are not recommended construction.

3.2 RC-1 Resilient Channel erection

(See specifications in U.S.G. Folder SA-924).

3.3 steel stud and runner erection

(See specifications in U.S.G. Folder SA-923).

3.4 metal furring channel erection

(See specifications in U.S.G. Folder SA-923).

3.5 control joint installation

Attach USG Control Joint No. 093 with Bostitch 9/16" "G" staples or equal spaced not over 6" apart in each flange. Cut end joints square and align for neat fit. Remove protective tape when joint treatment is completed.

3.6 fastener and adhesive application

3.6.1 USG Drywall Screws

Power-drive with an electric screwdriver so screwheads provide a slight depression below surface of gypsum panels without breaking face paper. Do not drive screws closer than %" from edges and ends of gypsum panels.

3.6.2 nails

Drive nails with heads slightly below gypsum panel surface in a un-

iform dimple $^{1}/_{32}$ " deep formed by crowned face of hammer. Drive nails no closer than 3 %" from edges and ends of panel.

3.6.3 adhesive

Mix and apply in accordance with manufacturer's directions, and as follows:

- a. Apply Durabond Joint Compound-210 or 90 in the prescribed manner to back of face panels to be laminated. Laminate face panels to (base layer panels) (coreboard) using moderate pressure and temporary nailing or shoring to insure adequate bond.
- b. Apply drywall stud adhesive in a continuous %" bead at center of attachment to face of framing members. Where two gypsum panels meet on a framing member, apply two parallel beads on face of framing at panel joints. Do not apply adhesive to members such as bridging, diagonal bracing, etc., into which no supplemental fasteners will be driven. Immediately following contact of panel to adhesive, apply necessary fasteners 16" o.c. around perimeter of panel, %" away from edges and ends. On ceilings only, apply one temporary field fastener per framing member at mid-width of board; remove after 24 hours. With predecorated panels pre-bowed and applied vertically, use permanent fasteners only at top and bottom of panel.
- c. Apply laminating adhesive in strips to center and along both edges of gypsum face panel. Apply strips with a notched metal spreader having four 1/4"x1/4" minimum notches spaced max. of 2" o.c. Position face panels against base panels; fasten at top and bottom (vertical application) as required. For laminated ceilings, space fasteners 16" o.c. along edges and ends, with one permanent field fastener per framing member installed at mid-width of panel. Press panel into place with firm pressure to insure bond; reimpact within 24 hr. if necessary.
- **d.** Apply liquid contact adhesive with a short nap paint roller to cover both contact surfaces according to adhesive manufacturer's directions. Let adhesive air dry to the touch. Apply panels as soon as possible after drying occurs. On walls, fasten 16" o.c. at top and bottom (vertical application) as required. In ceiling lamination, apply permanent supplementary fasteners at each corner of panel, and along edges spaced max. 48" o.c. Press panel into place with firm pressure to insure bond.
- e. Apply construction adhesive in continuous %" beads to framing. On walls, apply a continuous adhesive bead to center of studs to within 6" of board perimeter. At panel joints, apply two adhesive beads—one at a time—as each panel is installed. Do not apply adhesive at inside corners or to top and bottom plates, bridging, bracing and fire stops. Apply no more adhesive than can be covered in 15 min. Set panel in place, fasten 16" o.c. along top and bottom of panel and impact by hand along each stud.

3.7 pre-fill application

- a. Mix DURABOND 90 Joint Compound according to directions on bag. Do not overmix, or use extremely cold water or cold joint compound.
- **b.** Pre-fill all "V"-grooves formed by abutting tapered eased edges of SHEETROCK Brand SW Panels with DURABOND 90 Joint Compound using a flexible 5" or 6" joint finishing knife or Ames Pre-Fill Tool. Fill "V" joint flush and wipe off excess compound beyond the "V" groove, leaving a clear depression to receive tape. Allow pre-fill to harden prior to the next application (tape or embedding coat).

3.8 joint treatment application

- a. Mix joint compound in strict accordance with manufacturer's recommendations.
- b. Apply taping or embedding compound in a thin uniform layer to all joints and angles to be reinforced. Immediately apply PERF-A-TAPE

Reinforcing Tape centered over joint and seated into compound. Sufficient compound—approx. \(^{1}/64''\) to \(^{1}/32''\)—must remain under the tape to provide proper bond. Follow immediately with a thin skim coat to embed tape, but not to function as a second coat. Fold and embed tape properly in all interior angles to provide a true angle. The tape or embedding coat must be thoroughly dry prior to application of second coat (Exception: DURABOND Joint Compounds need only have hardened prior to application of next coat.)

- c. Apply second coat of joint compound over embedding coat, filling panel taper flush with surface; cover tape and feather out at least 2" beyond first coat. On joints with no taper, cover the tape and feather out at least 4" on either side of tape. Allow second coat to dry thoroughly prior to application of finish coat. (Exception: DURABOND Joint Compounds need only have hardened prior to second coat application.)
- d. Spread finish coat evenly over and extend at least 2" beyond second coat on all joints and feather to a smooth uniform finish. Over tapered edges, do not allow finished joint to protrude beyond plane of the surface. Apply a finish coat to cover tape and taping compound at all tapered angles and provide a true angle. Where necessary, sand lightly between coats and following the final application of compound to provide a smooth surface ready for decoration. When sanding take care not to roughen face paper.

3.9 finishing fasteners

Apply a taping or all-purpose type compound to fastener depressions as the first coat. Follow with a minimum of two additional coats of topping or all-purpose compound, leaving all depressions level with the plane of the surface.

3.10 finishing beads and trims

- a. Apply first coat to all bead and trim and properly feather out from ground to plane of surface. Compound must thoroughly dry prior to application of second coat. (Exception: DURABOND Joint Compounds need only have hardened prior to application of next coat.)
- **b.** Apply second coat in same manner as first coat, extending compound slightly beyond onto face of panel. Compound must be thoroughly dry prior to application of finish coat.
- c. Apply finish coat to all bead and trim, extending compound slightly beyond the second coat and properly feathering from ground to plane or surface. Sand finish as necessary to provide a flat smooth surface ready for decoration. When sanding take care not to roughen face paper.

3.11 exterior joint system application

- a. Mix Durabond Joint Compound according to directions on the bag. Do not overmix, nor use in temperatures below 45°F.
- b. Pre-fill joints of USG Exterior Gypsum Ceiling Board with DURABOND Compound. After pre-fill has hardened, embed PERF-A-TAPE Reinforcing Tape centered over joint. When compound has hard-

ened, immediately apply fill coat.

- c. Apply DURABOND Compound over flanges of USG Control Joints, metal beads and trim. Spot fastener heads.
- d. After fill coat has hardened, apply finishing coat of DURABOND Compound. Completely cover all joints, angles, beads, control joints and fasteners.

Note: After DURABOND Compound has dried, apply one coat oil-based primer-sealer and one coat exterior oil or latex paint.

3.12 filling and finishing interior concrete

- a. Concrete surfaces shall be clean, smooth, dry and free from contaminants and exposed metal protected with a rust-inhibitive primer and allowed to dry.
- b. Fill offsets and voids with a DURABOND Joint Compound.
- c. Mix (COVER COAT Compound) (DURABOND Joint Compound) according to manufacturer's directions and apply to concrete (ceilings) (columns) before interior partitions are erected. Coordinate application of USG No. 800 Corner Bead on angles and corners as required, embedding and covering both flanges with a smooth fill of compound 3" to 4" wide. Apply sufficient coats to obtain a smooth surface. With DURABOND Compound, apply a skim coat of COVER COAT Compound or USG Ready-Mixed Joint Compound over entire surface. After compound has dried, sand to a smooth surface suitable for decoration.

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, SHEETROCK, DURABOND, FIRECODE, TEXTONE, THERMAFIBER, DUR-A-BEAD, ULTRAWALL, PERF-A-TAPE, COVER COAT, RC-1, SUPER-TITE, GYP-LAP. FOAMULAR is a trademark of UC Industries.

Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions of for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

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TEXTONE vinyl-faced gypsum panels

Anything goes with these go-anywhere wall panels...now decorated in a new generation of neutral tones and textures



product folder

Unlimited design freedom begins with TEXTONE Predecorated Wall Panels...and new mix-and-match neutral tones

A warm traditional mood or casual modern look, a subtle scheme or dramatic motif...you set the scene and TEXTONE Wall Panels help make it happen with the magic of mix-and-match tones and textures.

Now that magic works even more potently for you. Now you can choose from fresh tones and textures that reflect today's trend to a neutral harmony, that spark new freedom in design.

What's more, you gain ready-made savings with TEXTONE Wall Panels. Predecorated (including matching mouldings, if desired), their in-place costs run far less than field-applied vinyl. You have no mess-no joint compounds, no taping. And you avoid schedule delays because you deal with one source.

You also reduce—almost eliminate—redecorating costs. Super tough vinyl coverings laminated to fireresistant gypsum panels keep their newly-decorated look for years and years. All it takes is routine soapy water cleaning.

On your next project, go with TEXTONE Wall Panels. Remember, anything goes.



Ranges listed in ascending cost range

Range A







Adobe-US-203

Desert Sand-US-205

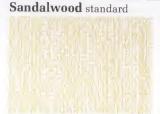




Terra Cotta-US-207

Marigold-US-204

Range B





Wheat-233749

Birch-206563





White Frost-US-220

Old Ivory-US-222

Range C

Linen standard





Champagne-108400

Straw - 735900

Range D

Textile standard





Mist White-51100

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Bone-US-202

Shell-US-201



Raisin-US-208

Slight color differences may exist between the printed colors shown and the actual colors on the product. A complete color guide of swatches is available on request.



Camel-205915



Summer Shore-US-223

Sandalwood accent



Toasted Honey-205907



Fawn-US-221

Woodgrain standard





Granada Cork standard



Pearl Gray-08647



Natural Pecan-08886



Saddle Tan-08646



Pewter-736000

Linen accent



Forsythia-736400



Autumn Rust-736300



Chalk-51000



Burnt Orange-79900



Burnished Gold-45200



Ginger-80000

TEXTONE Gypsum Panels... anything goes with mix-and-match walls

Embossed in durable vinyl film, TEXTONE patterns are coordinated in color and texture for mix-and-match versatility. You can mix the colors of any range or contrast them with other patterns of TEXTONE Panels for appealing and imaginative interiors. Or color-match the panels for more restrained complementary impact. But whether you mix or match, there is virtually no limit to your choice of distinctive interiors. Strength and fire-resistance come with the product. The scuff-resistant vinyl facing of TEXTONE Panels is factory-laminated to a noncombustible core of gypsum.

TEXTONE Panels and color-matched mouldings, together with adhesives, fasteners and other conventional drywall components, are used for predecorated permanent partitions, in movable partitions, and in remodeling. The vinyl facing resists wear and is easily maintained.

In addition to Regular TEXTONE Panels, TEXTONE Panels are available with special FIRECODE gypsum core for use where firerated construction is required.

New! Pumice pattern

Compatibility is the essence of this new Pumice pattern which sets off the harmony of many different interior designs.

New! Sandalwood pattern

Subtle elegance touched with distinctive charm marks this new Sandalwood pattern, an inviting dimension in background beauty.

New! Suede pattern

The quiet appeal of soft suede leather as recreated in this new Suede pattern coordinates walls and furnishings beautifully.

Woodgrain pattern

Here, warm nature-colors and heavily-defined graining in light or medium-dark tones capture the impressive character of costly woods.

Granada Cork pattern

For a compelling background, your choice can be this classic Granada Cork pattern, echoing ancient Spanish times and glories.

Linen pattern (New Standard Color!)

The rich-appearing textured surface of this linen-like pattern provides an opportunity for the unusual in decorative walls.

Textile pattern (New Accent Colors!)

Reminiscent of classic tapestries that enhanced palace walls, the deep texture of this Textile pattern feels as real as it looks.



TEXTONE Decorative Mouldings... vinyl-surfaced to match TEXTONE Gypsum Panels, solid colors to blend with painted SHEETROCK Brand Gypsum Panels

These mouldings are used as covers for panel joints and edges, corner protection and trim around openings. They also provide finished beauty to TEXTONE Panel installations. Suitable for use with fixed or demountable partitions, both wood- and metal-framed.

TEXTONE Mouldings are precision-extruded from vinyl plastic (from aluminum in the case of AV-46) for snug fit and easy application. Plastic mouldings are furnished in two types: RPV Series, factory-laminated with vinyl in 31 attractive colors matching TEXTONE Panels; RP Series, available in solid colors of Ivory, Tan, Chocolate and Black, to accent or contrast with vinyl-surfaced TEXTONE Panels, or painted SHEETROCK Brand Gypsum Panels. Both series are made in four shapes to fit $\frac{1}{2}$ " and $\frac{5}{8}$ " panel thicknesses, easily cut, mitered and painted on the job. AV-46 Ceiling Drive-In Trim is precision-extruded aluminum which, like the RPV Series, is factory-laminated to vinyl matching TEXTONE Panels.

advantages

Easy Application — Moulding tolerances allow easy panel insertion without peeling or tearing vinyl surface.

Tight Fit—Mouldings accommodate normal panel thickness variations, yet hold panel tightly in place.

Fast Attachment—Fasteners easily penetrate plastic mouldings without pre-drilling.

installation

General—Mouldings should be stored at room temperature for 24 hr. before installation. Start installation at a corner or door that is plumb and level. Cut mouldings with a fine-tooth hacksaw,

mitering the same way as with wood mouldings. Cut $\frac{1}{16}$ " short for a loose fit to allow for thermal expansion; never force mouldings into place. Fasten mouldings with flat-head wire nails, staples or drywall trim-head screws 8 to 12 in. o.c. (for snap-on mouldings, through holes in the retainer).

RP-2 and **RPV-2** Inside Corner—Install first panel so that vertical edge aligns with framing. Apply moulding over first panel, fastening exposed flange to framing. Insert opposite panel into moulding.

RP-4 and **RPV-4** End Cap—Align and fasten end cap to framing. Insert panel into moulding, apply panel to wall.

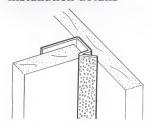
RP-5 and **RPV-5** Snap-on Corner—Apply panels using adhesive or adhesive/nail-on application. Place retainer strip over joint, fasten with nails or screws driven through holes provided and snap corner face onto retainer strip.

RP-7 and **RPV-7** Snap-on Batten—Apply panels using adhesive or adhesive/nail-on application. Place retainer strip over joint, fasten with nails or screws driven through holes provided and snap between face onto retainer strip.

AV-46 Ceiling Drive-in Trim—Use only with steel-stud partitions. Install after panels are applied. Insert grooved flange between runner and ceiling; tap trim into place.

Painting—RP Series mouldings in Ivory color should be used when painting is required to match job colors. Apply a good alkyd enamel (such as TAL Alkyd Semi-Gloss Enamel) or acrylic latex paint (such as TAL Semi-Gloss Enamel or Latex Wall Paint) according to manufacturer's directions.

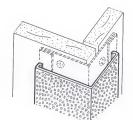
installation details



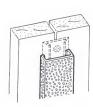
RP-2, RPV-2 Inside Corner



RP-4, RPV-4 End Cap



RP-5, RPV-5 Snap-On Corner



RP-7, RPV-7 Snap-On Batten



AV-46 Ceiling Drive-In Trim

specifications—TEXTONE Mouldings

	si	ze	length (1)	approx, wt.				
product			9 ft (2.7 m)	(lb/1,000 ft)		(kg/100m)		
	½ in (12.7 mm)	% in (15.9 mm)		½ in.	% in.	12.7 mm	15.9 mm	
Plastic								
RP-2, RPV-2 Inside Corner	X	X	X	76	77	11	11	
RP-4, RPV-4 End Cap	X	×	X	66	66	10	10	
RP-5, RPV-5 Snap-on Corner	fits al	l sizes	X	1:	84	2	7	
RP-7, RPV-7 Snap-on Batten	fits al	l sizes	X		95	1	4	
Aluminum								
AV-46 Ceiling Drive-in Trim	fits a	ıll sizes	12 ft. only		155		23	

⁽¹⁾ Standard length is 9 ft.; length from 8 ft. to 12 ft. of any moulding also are available on special order.

TEXTONE Gypsum Panels... installation & maintenance/technical data

limitations

- For adhesive application of TEXTONE Panels, only water-based adhesives are recommended. Other adhesives may not be compatible and could result in delamination and discoloration of vinyl surface.
- 2. If TEXTONE FIRECODE Panels are used in a fire-rated assembly, instead of SHEETROCK Brand FIRECODE Panels, the applicable fire test must permit exposed joints or battens. Type of adhesive usually is limited to DURABOND Joint Compound-210 or 90.
- 3. Not recommended for use over foil-back panels in exterior walls.
- 4. Avoid exposure to excessive or continuous moisture and extreme temperatures.

technical data

Surface—5-, 6- and 8-mil unbacked vinyl film (except cotton sheet fabric-backed Textile pattern), deeply embossed for texture or woodgrain effects. In 31 attractive colors and textures, divided into four price ranges.

Edge Configuration—classic beveled edge; forms a shallow "V"-groove joint.

Specification Compliance—All panels meet Fed. Spec. SS-L-30D, Type III; the base gypsum panels, ASTM C36. Textile vinyl fabric meets Fed. Spec. CCC-W-408A, Type 1 (Light Duty).

Availability—Nationwide stocks: ½" thick, 4' wide, and 8', 9' and 10' long in Standard patterns of TEXTONE panels. Other lengths, thicknesses, Accent patterns and FIRECODE Panels may be subject to minimum quantity and production lead time (Accent requires 6 to 8 weeks for delivery). Small orders for non-standard lengths and thicknesses may incur nominal surcharge. Check local availability. TEXTONE Vinyl Wallcovering, supported film 54" wide, with 1.4 oz. per sq. yd. cotton-sheet backing, is offered separately in limited quantities to provide a commercial match with TEXTONE Panel colors and textures on adjacent walls and columns. Available in rolls of 30 lin. yds.

light	reflectance	values	(1)

pattern	value	pattern	value	
pumice				
Adobe	53	Marigold	41	
Desert Sand	41	Caramel	20	
Bone	61	Terra Cotta	21	
Shell	73	Raisin	12	
suede				
White Frost	64	Summer Shore	48	
Old Ivory	61	Fawn	28	
sandalwood				
Wheat	64	Camel	45	
Birch	57	Toasted Honey	37	
woodgrain				
Royal Oak	25			
Natural Pecan	15			
cork				
Pearl Gray	60			
Saddle Tan	37			
linen				
Pewter	56	Autumn Rust	31	
Straw	56	Forsythia	60	
Champagne	60			
textile				
Chalk	50	Burnished Gold	32	
Parchment	43	Burnt Orange	18	
Mist White	63	Ginger	12	

⁽¹⁾ Average values, Baumgartner Integrating Sphere Reflectometer

surface burning characteristics (1)

Juliuce Dullin	15 CHAIACICI 13	1103 (1)			
TEXTONE panel pattern	film thickness	flame spread	fuel contrib.	smoke dev.	vapor permeance
pumice	6	20	20	10	0.8
suede	6	15	10	25	0.6
sandalwood	5	15	20	10	0.8
woodgrain	6	20	5	15	0.6
cork	6	20	5	15	0.8
linen	8	20	5	60	0.5
textile	wt. 10.7 oz./yd²	25	10	65	1.0

(1) Tested in accordance with ASTM E84-80 by Southwest Research Institute.

good design practices

- 1. For fire-rated assemblies, refer to application requirements of the specific system tested. Mechanical fastening is usually required along with a specific type of adhesive.
- 2. Adhesives—for more complete details and application using adhesives, see U.S.G. Folder SA-927 and manufacturer's directions.
- 3. Additional installation details—refer to WB-1330.

architectural specifications

Part 1: general

1.1 scope - Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company. Installation of TEXTONE Vinyl-Faced Panels shall be by workmen experienced in this trade.

1.3 delivery and storage of materials

All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions

In cold weather the building shall be heated and ventilated during application of gypsum vinyl panels to maintain temperature and ventilation consistent with good working conditions for finish work.

Part 2: products

- ${\bf 2.1}$ gypsum vinyl panels: TEXTONE (type) (pattern and color) (thickness and size) (core formulation).
- **2.2 mouldings and trim:** (RP) (RPV) (AV) (type) TEXTONE Mouldings, (pattern), (color).
- **2.3 adhesives:** DURABOND Joint Compound-210 or 90. Specify from Gypsum Panels and Accessories Folder, SA-927.

2.4 fasteners

- a. Matching Color Nails (color) (length).
 Specify: 1%" for single layer, 1%" for double layer.
- b. USG Type S Screws (length). Specify: 1" for single layer, 15%" for double layer.
- c. Vinyl Foam Tape: 1½" wide (min.), ½2" to ¼16" thick. Specify: to eliminate mechanical fasteners or temporary bracing and for temporary attachment of adhesively applied panels until adhesive attains maximum bonding strength.

2.5 fasteners (mouldings and trim)

- a. USG Screws— (1" Type S Bugle Head)
 (1¼" Type W Bugle Head).
- b. Nails—obtain locally —($\frac{3}{4}$ " x 18 Flat-Head Wire) ($\frac{11}{4}$ " GWB-54 Annular Ring).

Part 3: execution

3.1 TEXTONE Gypsum Panels—wood or steel studs

Apply 8"-long strip of vinyl foam tape to face of each stud, positioned at midpoint of studs up to 8' long, at third-points on studs up to 12' long and quarter-points on studs over 12'. Where no mechanical fasteners are to be used at top or bottom of stud, apply an 8"-long strip of tape. Apply a continuous %" bead of drywall stud adhesive to the entire face of studs between vinyl foam tape. Immediately apply TEXTONE Panels vertically and apply sufficient pressure to insure complete contact with both tape and adhesive.

3.2 TEXTONE Gypsum Panels—base layer of gypsum panels

Apply liquid contact adhesive to back of TEXTONE Panels and face of base layer according to adhesive manufacturer's directions.

Allow adhesive to air-dry, then bring panels in contact. Impact entire surface to assure complete contact.

3.3 TEXTONE Gypsum Panels—base layer of masonry, gypsum board, wood or mineral fiber board

For interior masonry walls and gypsum board, apply continuous strips of vinyl foam tape to entire width of TEXTONE Panel back at midpoint and $3\!\!/\!''$ from each end. Spread laminating adhesive over entire area of panels between tape using notched metal spreader with $1\!\!/\!'' \times 1\!\!/\!''$ notches spaced 2" o.c. Position panel and immediately apply sufficient pressure to assure complete contact over entire surface. (Mechanical fasteners may be substituted for tape at ends of panels.)

For application of TEXTONE Gypsum Panels to wood or mineral board, pre-bow panels and apply laminating adhesive over entire back surface. Use mechanical fasteners at top and bottom of panel.

3.4 TEXTONE Mouldings

Finish panel joints, edges and corners with TEXTONE Mouldings matching specified panel finishes and installed according to manufacturer's directions.



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Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

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UNITED STATES GYPSUM

101 South Wacker Drive, Chicago, Illinois 60606

Everything it takes to enhance interior/exterior surface esthetics

United States Gypsum knows the interior construction business. Their high-performance texture finish and paint products have helped produce attractive interiors in millions of homes and commercial buildings. Each product has built-in quality that saves application labor, permits the finest finishing. Products are available in four special-purpose groups:

Texture Finishes—the industry's broadest line, leading resurgence of surface ornamentation, includes IMPERIAL QT Spray Texture Finish for an acoustical appearance on ceilings; paste and powder products for various textures and finishes; plus a line of ready-mixed Textone textures featuring one-coat convenience, and four choices in one or two gal. sizes.

Interior Finishes—emulsion line headed by TAL Latex Wall paints, both flat and eggshell finish with matching latex semi-gloss enamel.

Exterior Wood and Masonry Coatings—water-based emulsion, breather-type house paints perform superbly over wood siding and shingles as well as masonry surfaces; performance history now favors latex over solvent-based paints for house exteriors. TAL Acrylic-Latex House and Trim Enamel (medium sheen) is U.S.G.'s premium product. TAL Vinyl-Acrylic House Paint provides low-sheen appearance and beauty for primed wood and masonry. Coatings for masonry provide a choice of three types including a ready-mixed product.

Surface Preparation Products—this long-established leadership line includes latex interior primers, oil-based exterior primers, penetrating sealer, block filler, spackling compounds, and USG LIME LOCKER Sealer for new plaster surfaces.

This catalog covers the finishing products recommended for virtually all U.S.G. partition and ceiling assemblies, as well as for exteriors. A complete, quick-reference Selector Guide to USG Paint Products appears on pages 4 and 5; a Selector Guide to USG Texture Products on page 6. General specifications start on page 7. Drywall joint treatment products are covered separately in Folder SA-927.

benefits

Product variety—broader choice

U.S.G. is the largest producer of gypsum and other wall and ceiling construction materials. So you have a complete line of complementary and compatible products—textures, paints, interior/exterior coatings, and surface materials—all from one convenient source. And all formulated in a variety of products to multiply your design options.

Decades of experience—highest quality products

Today's full range of USG Interior, Exterior and Texture Coatings reflects decades of research and testing, both in the laboratory and the marketplace. U.S.G. has the broadest job experience in the industry; 45% of all American homes are built or finished with its various products. Finishing products undergo daily analysis and improvement at the Research Center to meet standards of quality without compromise.

Unit responsibility—reliable performance

Use of USG Textures and Paints can bring the important advantage of dealing with a single manufacturer who is responsible for all components of the finished wall or ceiling—gypsum base and veneer finishes or gypsum panels and joint treatment, drywall screws and adhesives, steel studs and accessories, insulation, sheathing, ceiling tile and exterior stucco. All are made by U.S.G. to work together.



general limitations

The most common causes of paint failures on interior surfaces are: (a) Base surface not dry; (b) Surface improperly cleaned and patched; (c) Variable suction in the base; (d) Failure to use proper treatment for different surfaces, conditions, and finishes. It is estimated that 75% of interior paint failures are due to neglected or improper preparation before the paint can was opened.

Satisfactory results with USG Paint products, as with all finishes, depend upon good job practices:

- 1. Surfaces to be painted must be clean, dry, sound; free of grease, oil, wax, dust and other foreign matter; free of flaking, crumbling or chalking conditions; must be properly prepared.
- 2. Atmospheric and structural temperatures must be 50° to 60°F. minimum during application, depending upon type of finish; consult directions.
- **3.** Paints of the water-thinned type should not be used over wallpaper having water-soluble colors; must be protected from freezing.
- 4. New unpainted plaster (except veneer plaster), stucco, poured concrete, patches in masonry surfaces must age 30 to 60 days minimum prior to paint application.

Any other limitations are stated in the label directions for each product.

5. Heavy water-based textures may result in sagging of gypsum board ceilings under these conditions: high humidity, improper ventilation and/or board application to framing and insufficient board thickness for span between supports. Application of a primer equalizes surface porosity and provides a uniform color. Primers are not intended to reduce sag potential. When using water-based textures, refer to the following table:

board thickness (in.)	application method (long edge relative to frame)	maximum frame spacing o.c. (in.)		
3/8	Not Recommended	_		
1/2	Perpendicular Only	16		
5/8	Perpendicular Only	24		

Note: Double layer laminated, 3/4" or greater total thickness—24" o.c.

Interior Texture Finishes set the stage for your designs

The decorating trend is to textures. Without costing a fortune, they satisfy the popular demand for distinctive interior styling—flattering finishes, customized interiors and rustic surfaces that simulate natural materials.

U.S.G. texture finishes offer a palette of patterns for a variety of esthetic effects. Textures and patterns in paste or powder products can be mixed or matched to contrast, complement or accent elements in your interior design scheme. For spray application to exteriors, Duracal Spray Texture Finish is available.

U.S.G. textures are economical, too. They often cost less to apply than paint because they go on quicker. Textures also hide minor surface blemishes to reduce surface preparation time. Products include:

IMPERIAL QT Spray Texture Finish—aggregated non-asbestos powder, produces acoustical finish appearance on ceilings; provides no acoustical correction. Excellent bonding qualities; helps conceal surface defects. Formulated with vermiculite, polystyrene or perlite aggregates for spray application in supercoarse, coarse, medium or fine textures. White only. First coat of alkyd flat wall paint or good quality primer-sealer recommended. Surface burning characteristics: flame spread 5, fuel contributed 0, smoke developed 0 for perlite- and polystyrene-aggregated formulation; flame spread 5, fuel contributed 5 and smoke developed 0 for vermiculite formulation applied over SHEETROCK Brand Gypsum Panels. Limitation: not recommended for use where humid conditions exist.

USG Multi-Purpose Texture Finish—an economical, unaggregated, non-asbestos powder product for producing light to medium-light textures on drywall or other interior surfaces. Textured effect obtained by brush, roller or spray application. Helps conceal minor surface defects. Dries to a sparkling white finish which blends with ceiling texture overspray. Usually overpainted on walls, may be left unpainted on ceilings. Not washable unpainted.

USG Hi-Build Ready-Mixed Texture Finish—a white, non-asbestos, latex-type material for interior surfaces, offers super-thickness with the speed of a ready-mixed formulation. Develops a tough, durable surface with minimal to no fissuring. Stucco or Travertine textures can be readily achieved. Allows greater pattern versatility not possible with thinly applied products. Can be job-mixed with a variety of aggregates for greater coverage and applied with brush, roller, spray gun or trowel for a range of texture effects.

USG Ready-Mixed Texture Compound—a white, non-asbestos, latex-type material for interior surfaces, offers the speed and convenience of ready-mix formulation. Provides extra tough and durable finish. Attractive textures, such as stomp or crow's foot, Monterey or knock-down, orange peel, fog coat and others can be readily created with roller, brush or spray gun. Its handsome finish can be left unpainted on remote non-contact surfaces, or overpainted for protection against soiling, if desired.

TEXTONE Light Sand Texture—a ready-to-use, fine sand aggregated, vinyl-acrylic paste texture for interior surfaces. Helps conceal voids, pores and minor defects. Swirl patterns and other designs produced with paint or texturing brush or roller. White, tintable to pastel colors, washable when overpainted.

TEXTONE Coarse Ceiling Texture—produces heavy-stipple, aggregated texture with roller application. Ready-to-use, heavy-bodied, vinyl-acrylic paste with medium aggregate readily conceals minor defects on interior ceilings. White. May be left unpainted or overcoated with TAL Latex Wall Paint.

TEXTONE Smooth Design Texture—a non-aggregated, heavybodied, vinyl paste for interior surfaces. Job-thinned with water for desired texture—smooth, "crow's foot", roller stipple or spray/splatter pattern. White. For maximum durability and deeper colors, overpaint with TAL Latex Wall Paint.

TEXTONE Interior/Exterior Stucco Texture—a heavy-bodied, ready-to-use, vinyl-acrylic paste with medium aggregate. Helps conceal minor surface defects, provides extremely durable white texture on masonry, concrete, primed metal and wood—most interior and exterior substrates. Tintable to pastel colors, overpaint for deeper colors.

USG Texture I—a ready-to-use vinyl-acrylic paint embodying a fine aggregate to produce a slight sand-finish effect combined with light texture. One coat covers fine cracks, blemishes. Quick-drying, tintable.

USG Texture II—low-gloss ripple finish in a latex emulsion. Contains no sharp aggregate, can produce fine texture ranging from "orange peel" effect to smooth rounded stipple. Conceals moderate imperfections, normally requires no sealer. Quickdrying, washable, recoatable, tintable.

USG R/M Smoothcoat and Texture—a heavy-bodied, ready-touse, vinyl-acrylic interior finish. Job-thinned with water for desired effect—smooth, roller-texture or specified texture design. Conceals imperfections; dries to hard white surface.

TEXOLITE Sanded Paste Stipple—a white, water-base sanded finish for interior walls and ceiling. Tinting not recommended; readily coated with most wall paints.

USG Spray Texture Finish—a top-performance non-asbestos powder product available aggregated or unaggregated. Fast drying; offers good concealment and superior coverage. Produces light spatter, fog-and-spatter and orange peel finishes with machine spray and light stipple texture with roller application on most interior wall and ceiling surfaces. Highly effective on sidewalls; blends with ceiling texture overspray. Tinting not recommended; readily overcoated with most wall paints. Not washable unpainted.

USG Drywall Surface-Texture XII—a non-asbestos powder product, mixed with water, for fast, low-cost spray application to interior gypsum drywall surfaces. Available aggregated for sand finish and unaggregated for smooth vinyl finish. Combines easy mixing, fast drying, excellent coverage and good concealment. An ideal base for wall paints; may be left unpainted on ceilings.



Interior Wall and Ceiling Paints from flat to semi-gloss

TAL Latex Wall Paint—ready-to-use in Flat, Semi-Gloss or Eggshell Finish, offers top quality with economy, easy-flowing application. Good one-coat hide can usually be achieved; provides a washable film. Vinyl-acrylic latex vehicle, uses water for thinning and cleanup. 12 colors matched in TAL Latex Semi-Gloss Enamel or TAL Latex Eggshell Finish.

TAL Latex Semi-Gloss Enamel—latex semi-gloss matching all ready-mixed colors of TAL Latex Wall Paint. For interior wood trim and wall surfaces of kitchen, bath, laundry; self-priming on new work. Dries to medium sheen with outstanding washability, excellent color retention. Vinyl-acrylic latex vehicle.

TAL Super Ceiling White—latex product especially formulated for ceilings. Dead-flat surface offers soft, pleasant light reflectance, uniform appearance helps mask surface irregularities. Applied with brush, roller or spray.

TEXOLITE Vinyl Wall Paint—a latex finish in vinyl-acrylic vehicle with good working and performance qualities. Primarily intended for economical project and job work. Covers and touches up well. Applied with brush, roller or spray; dries to a slight sheen finish.

U.S.G. EXCEPTIONALE* Color System includes more than 1,300 appealing custom colors and COLOR-CUE* Color System offers 980 colors, grouped by color family. Both are available on special order through dealers using COLORTREND* Colorants. This color range is offered in five products: TAL Latex House & Trim Enamel, TAL Vinyl-Acrylic House Paint, TAL Latex Wall paint, TAL Eggshell Finish, and TAL Latex Semi-Gloss Enamel.

*Trademark of Tenneco Chemicals Inc., Cal-Ink Div.

Exterior and Masonry Coatings upgrade job appearance and performance

TAL Acrylic-Latex House and Trim Enamel—water-thinned, medium-sheen finish provides long-lasting protection for wood trim and siding. Spreads easily, dries fast. One coat usually covers; gives two-coat beauty. Acrylic and polyester resin vehicle. Provided in 4 ready-mixed colors, white, black and machine tint bases.

Tal Vinyl-Acrylic Latex House Paint—an economical nonpenetrating latex coating for unglazed masonry, stucco, wood shakes and primed siding. Combines good hiding, weather resistance, true nonfading color, quick drying. Breather-type formulation permits unwanted moisture to escape. Two coats produce best results. 9 colors, white and machine tint bases.

DURACAL Exterior Spray Texture Finish—a thick, ready-to-use latex aggregated coating for spray application to old or new primed wood, metal, concrete surfaces; asbestos siding or in USG Exterior Ceiling Board construction. Heavy texture hides most surface blemishes. Flexible, mildew and water resistant when applied as recommended. White and special colors in 100-gal. quantities or more. Meets performance requirements of Fed. Spec. TT-C-555B, Type 2.

CEMENTICO Masonry Coating—a water-repellent hydraulic cement base paint in powder form, to be mixed with water. For interior and exterior porous masonry surfaces. Excels in hardness, durability and workability at low cost. Two coats recommended; sand may be added for coating to be scrubbed into masonry for a smoother, denser surface. Lime-proof, alkaliresistant; available in white and on East Coast only.

DURABOND Waterproofing Coating—Ready-Mixed—a heavy-bodied coating to decorate and protect porous masonry surfaces against water penetration. Performance backed by 5-year limited warranty. Alkali- and mildew-resistant over unpainted surfaces. Applied in two coats alone or over DURABOND Water-Stop (see Surface Preparation Products). Meets Fed. Spec. TT-P-1411A. White only, tintable to light pastels. DURABOND Waterproofing Coating, a sanded powder product, is also available in white only. Special DURABOND Waterproofing Latex Additive should be specified with the powder product to improve adhesion, harden surface and minimize dryout problems.









Selector Guide to USG Texture and Paint Products

construction type of finish trea		special surface treatment new work	redecorating	finish product description	thinners	method application	hours drying time touch	me recoat	coverage (sq. ft.)
INTERIOR WALLS Block, Brick or	Flat, Smooth Surface	TAL Super Block Filler	TAL Super Block Filler (opt.)	TAL Latex Flat or Eggshell Wall Paint	NR/w	R1, S1, B2	1/2	8	300
Concrete	Flat, Natural Texture	TAL Latex Undercoater	None	TAL Latex Flat or Eggshell Wall Paint	NR/w	R1, S1, B2	1/2	8	300
	Semi-Gloss, Smooth Surface	TAL Super Block Filler	TAL Latex Undercoater	TAL Latex Semi- Gloss Enamel	NR/w	S1, B2, R2	3	24	350-400
	Semi-Gloss, Natural Texture	TAL Latex Undercoater	TAL Latex Semi- Gloss Enamel (opt.)	TAL Latex Semi- Gloss Enamel	NR/w	S1, B2, R2	3	24	350-400
	Medium Coarse Texture	Clean	Clean	TEXTONE Int/Ext. Stucco Texture	NR/w	R1, B2	2	8	30-60
	Cement, Smooth	Pre-wet	Clean, pre-wet	CEMENTICO Coating	W	B1, S2	_	24	16-24/lb.
	Cement, Sanded	Clean	Clean	DURABOND Water- proofing—Ready-Mixed	MS	B1, R2	2	6	75-125
Plaster and Veneer Finish	Flat	USG LIME LOCKER Sealer	None	TAL Latex Flat Wall Paint	NR/w	R1, S1, B1	1	24	350-400
	Semi-Gloss	USG LIME LOCKER Sealer		TAL Latex Semi-Gloss Enamel	NR/w	S1, B2, R2	3	24	350-400
Gypsum Panels	Velvet	TAL Vinyl Sealer or TAL Latex Undercoater	TAL Latex Wall Paint	TAL Flat or Eggshell Wall Paint	NR/w	B1, R1, S1	1/2	24	350-400
	Flat	TAL Vinyl Sealer or TAL Latex Undercoater	Prime if needed	TAL Latex Flat Wall Paint	NR/w	R1, S1, B1	1	24	350-400
	Semi-Gloss	TAL Latex Semi- Gloss Enamel	Self-priming	TAL Latex Semi- Gloss Enamel	NR/w	S1, B1, R1	1	24	350-400
	Sand Float Texture	None	None	USG Texture I	NR/w	B1, R1	1/2	24	200
	Orange-peel-to Ripple Texture	None	None	USG Texture II	NR/w	B1, R1, S1	1/2	24	200
	Heavy Stipple Texture	As required	As required	USG R/M Smoothcoat; then TAL Paint	W	B, R, O	1	12	50-250
	Medium Light to Medium Heavy Texture	Usually none	None	USG R/M Smoothcoat; then TAL Paint (also 2 finishes below)	W	B, R, O	1	12	50-250
	Medium Coarse Texture	None	None	TEXTONE Int./Ext. Stucco Texture	NR/w	R1, B2	2	8	30-60
	Smooth to Stucco Pattern	None	None	TEXTONE Smooth Design Texture	W	B, R, T	1	12	40-125
	Light Sand Texture	None	None	TEXTONE Light Sand Texture	W	B, R	1	12	up to 200
	Sand Finish	None	None	TEXOLITE Sanded Paste Stipple	W	B, R, S	1	12	up to 200
Wood, nterior	Semi-Gloss	TAL Latex Semi- Gloss Enamel	TAL Latex Semi- Gloss Enamel (Self-Priming)	TAL Latex Semi- Gloss Enamel	NR/ms	S1, B1, R2	3	24	300-350
	Flat	TAL Latex Flat Wall Paint	None—dull gloss	TAL Latex Flat Wall Paint	NR/w	R1, S1, B1	1	24	350-400
	Medium Coarse Aggregate Texture	TAL Latex Undercoater	None	TEXTONE Int/Ext. Stucco Texture	NR/w	R1, B2	2	8	30-60
fletal Ferrous)	Medium Coarse Aggregate Texture	Rust inhibitive primer	Rust inhibitive primer	TEXTONE Int/Ext. Stucco Texture	NR/w	R1, B2	2	8	30-60
fetal Galvanized)	Medium Coarse Aggregate Texture	Rust inhibitive primer	Rust inhibitive primer	TEXTONE Int./Ext. Stucco Texture	NR/w	R1, B2	2	8	30-60

NOTES: "Drying Time" and "Coverage" estimates are based on average conditions. Touch = furniture can be returned to living areas.

Abbreviations, Methods of Application: B = brush, R = roller, S = spray, T = trowel, O = other; 1, 2, 3 = order of preference. Abbreviations, Thinners: NR/w—not recommended, use water sparingly; NR/ms—Not recommended, use mineral spirits if needed; W—water per directions; MS—mineral spirits per directions.

Selector Guide to USG Texture and Paint Products

construction materials	type of finish desired	special surface treatmen	t redecorating	finish product description	thinners	method application	hours drying time touch	recoat	coverage (sq. ft.)
INTERIOR CEILINGS Acoustical Tile or	Low Sheen	None	None	TAL Latex Semi-Gloss or Eggshell Enamel	NR/w	B1, R1, S2	1/2	8	350-400
Plaster	Flat (Low Scrub)	None	None	TAL Latex Flat or TEXOLITE Std. Paint	NR/w	R1, S1	1	8	200
Gypsum Panels	Flat (Med. Scrub)	None, or TAL Latex Undercoater	None	TAL Super Ceiling White Paint	NR/w	B1, R1, S1	1/2	8	300
	Flat (High Scrub)	TAL Latex Undercoater	None	TAL Super Ceiling White Paint	NR/w	B1, R1, S1	1/2	8	350
	Textured	USG Texture I or II	USG Texture I or II	Any of above finishes for gypsum panels— interior walls	see above	see above	see above	see above	see above
	Medium Texture	None	None	TEXTONE Coarse Ceiling Texture	NR/w	R1, B2	1	8	30-60
Drywall Poured Concrete	Rough Texture	TAL Vinyl Sealer	TAL Vinyl Sealer	IMPERIAL QT Spray Texture Finish	W	S only	24	not rec	. —
EXTERIOR SURFACES New—Block, Brick Stucco or Poured Concrete	Low Sheen			TAL Vinyl-Acrylic Latex House Paint	NR/w	B1, R1, S1	1/2	8	350
Old, Light Chalk—Block Brick, Stucco or Poured Concrete	Low Sheen			TAL Vinyl-Acrylic Latex House Paint	NR/w	B1, R1, S1	1/2	8	350
Old or New (unpainted) Block, Brick, Stucco or Poured Concrete	Smooth (Cement)	Clean, free of dust, porou	s-pre-wet, post-wet	CEMENTICO Coating	W	B1, S1	_	24	16-24 (per lb.)
	Sanded (Cement)	Clean, free of dust, porou	Clean, free of dust, porous—pre-wet, post-wet		W	B, T	_	24	16-24
USG Exterior Ceiling Board	Heavy Texture	Clean, dust-free IMPERIAL House Primer	Clean, dust-free IMPERIAL House Primer #894 White		NR/ms (For primer only)	S only	2	24	30-50
Wood Surfaces	Heavy Texture	Clean, dust-free IMPERIAL House Primer	#894 White	DURACAL Exterior Spray Texture Finish	NR/ms (For primer only)	S only	2	24	30-50
New—Unpainted	Low Lustre	IMPERIAL House Primer	#894	TAL Vinyl-Acrylic Latex House Paint	NR/w	B1, R1, S1	1/2	8	350
	High Sheen	IMPERIAL House Primer	#894 White	TAL Acrylic-Latex House & Trim Enamel	NR/w	B1, R1, S1	1/2	12	350
Repaint—Wood Medium Chalk	Low Lustre	Dust off dirt and cobwebs remove mildew.	s, wash off chalk,	TAL Vinyl-Acrylic Latex House Paint	NR/w	B1, R1, S1	1/2	8	350
	High Sheen	Wire brush, wipe off chall prime bare spots, remove		TAL Acrylic-Latex House & Trim Enamel	NR/w	B1, R1, S1	1/2	12	350
Repaint-Wood Heavy Chalk	Low Lustre	Wash with hose and rag, remove mildew.	flush with water,	TAL Vinyl-Acrylic Latex House Paint	NR/w	B1, R1, S1	1/2	8	350
	Gloss	Wire brush, dust, prime w House Primer #894 White		TAL Acrylic-Latex House & Trim Enamel	NR/w	B1, R1, S1	1/2	12	350
Pre-Primed Wood Siding	Low Lustre	Prime with IMPERIAL House Primer #894		TAL Vinyl-Acrylic Latex House Paint	NR/w	B1, R1, S1	1/2	8	350
	High Sheen			TAL Acrylic-Latex House & Trim Enamel	NR/w	B1, S1, R1	1/2	12	350
Hardboard Siding	Low Lustre	IMPERIAL House Primer #	#894 White	TAL Vinyl-Acrylic Latex House Paint	NR/w	B1, R1, S1	1/2	8	350

Selector Guide to USG Powder Texture Products

construction	type of finish desired	special surface new work	treatment redecorating	finish product description	thinners	method application	drying time	coverage/lb (sq.ft.)(1)
INTERIOR CEILINGS	Coarse texture	Primer & sealer req'd.	Primer & sealer req'd.	IMPERIAL QT Texture Finish (VC-Coarse) (PC-Coarse) (PS Super-Coarse) (STC-Coarse)	W	S	Medium	6-8
	Medium texture	Primer & sealer req'd.	Primer & sealer req'd.	IMPERIAL QT Texture Finish (V-Medium) (P-Medium) (ST-Medium)	W	S	Medium	6-8
	Fine texture	Primer & sealer req'd.	Primer & sealer req'd.	IMPERIAL QT Texture Finish (Fine)	W	S	Medium	6-8
INTERIOR Light-to WALLS medium CEILINGS textures, medium stipple	medium textures, medium	Primer req'd.	Primer req'd.	USG Multi-Purpose Texture Finish	W	B, R, S	Fast	15-20 spray 10-15 hand
				USG Hi-Build Ready-Mixed Texture Finish or USG Ready-Mixed Texture Compound	W	B, R, S	Medium	Hand 3-5 (powet lb.) Spray 7-8 (per wet lb.)
	Heavy stucco or Traver- tine finish	Primer req'd.	Primer req'd.	USG Hi-Build Ready-Mixed Texture Finish	W	B, R, S, T	Medium	Hand (3-5) (per wet lb.)
	Light splatter, fog-and- light "orange peel"	Primer req'd.	Primer req'd.	USG Spray Texture Finish (aggregated or unaggregated)	W	S, R	Fast	16-20 ceilings, 41-50 walls
	Sand-finish effect or smooth vinyl finish	Primer req'd.	Primer req'd.	USG Drywall Surfacer- Texture XII (aggregated or unaggregated)	W	S	Fast	16-20 ceilings 29-35 walls

⁽¹⁾ Coverage figures are intended to provide a relative comparison between products when mixed and applied according to directions, not to provide a figure for job estimating purposes. Coverage can vary depending on factors such as manufacturing plant, condition of substrate, amount of dilution, spray techniques and procedures, thickness and uniformity of coating, and market preferences in finished texture appearances. NOTES: Thinners: W—water per directions; Method of Application: B = brush; R = roller; S = spray. Also see Selector Guide pages 4 and 5 for ready-mixed paste texture products.



USG Multi-Purpose Texture Finish



Monterey or knock-down texture can be readily created with roller, brush or spray using USG Ready-Mixed Texture Compound.



IMPERIAL QT Texture Finish, Coarse, produces a striking acoustical appearance with an unusual decorating effect.

Surface Preparation Products for interiors, exteriors from one source

USG LIME LOCKER Sealer—a white pigmented, ready-to-use latex primer-sealer for new interior plaster surfaces. Easily applied, quick-drying, locks in alkali (lime) and provides excellent bond for breather-type finish coatings.

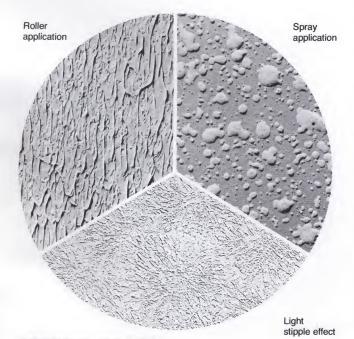
TAL Latex Undercoater—a ready-to-use, pigmented latex for priming and sealing interior gypsum panels and wood trim surfaces. Excellent base for water- or solvent-thinned, flat, eggshell, semi-gloss or gloss products. Flows out immediately to a flat finish that dries quickly. Use for first-coating surfaces of gypsum panels, galvanized steel and wood trim or for same-day decorating. Works well over painted surfaces, but not recommended for exterior use or bleeding type wood.

USG Vapor Seal—this dual purpose water-thinned, pigmented primer-sealer reduces water vapor transmission through interior unpainted gypsum panel walls and ceilings in new construction and painted surfaces in remodeling. Provides vapor retarder with permeance of less than 1.0 perm, when fully cured, to help prevent interior moisture from entering exterior wall and ceiling spaces. Not recommended for floors, basement walls or priming metals.

TAL Vinyl Sealer—a pigmented, quick-drying primer-sealer for use on interior gypsum panels, canvas, concrete block. Recommended for use under alkyd paints and enamels, and under IMPERIAL QT Spray Texture Finish to minimize joint flashing. May be tinted.

IMPERIAL House Primer #894—solvent-base primer to prepare new or chalky wood surfaces for TAL Vinyl-Acrylic House Paint. Lead-free, blister-resistant, breather-type coating. White only.

Tal Super Block Filler—conceals voids, fills pores, gives uniform finish over interior, exterior masonry and other rough surfaces. Not a waterproofing material; must be recoated with exterior-grade paint for exterior exposure. May be coated with any paint except cement bonding type—Tal Vinyl-Acrylic Latex House Paint recommended for exteriors. May be tinted. Unaggregated. Durabond Water-Stop Compound—a quick-setting hydraulic ready-mixed or powder compound to control water penetration,



USG Multi-Purpose Texture Finish

USG Texture and Paint Products SA-933

plug cracks and openings in masonry. Also excellent for anchoring fixture bolts. Natural color, may be overcoated with DURABOND Waterproofing in powder or ready-mixed.

architectural specifications

Part 1: general

1.1 scope-Specify to meet project requirements.

1.2 qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be applied in accordance with its current printed directions.

1.3 submittals

Upon request, the contractor shall provide samples prepared in advance with the specified materials, which, when approved shall be the standards of finish to be provided on this project.

1.4 delivery and storage of materials

- a. All materials shall be delivered in their original containers bearing the manufacturer's name, brand name and directions for
- **b.** All containers shall be kept tightly closed when in storage, stored at moderate temperatures and protected from damage by tampering and exposure to the elements.

1.5 environmental conditions

- **a.** During cold weather, thermostatically controlled heat shall be provided to maintain (50°) (55°) (60°)F. temperature during and after application until building is occupied. Unvented gas or oil heaters shall not be used to provide heat. Adequate ventilation shall be provided at all times for proper drying.
- **b.** For exterior painting, atmospheric and surface temperatures shall be above 50°F. Paint shall not be applied in damp, foggy or rainy weather.

Part 2: products

2.1 materials

(Specify'surface treatment and finish materials from product descriptions and Selector Guide in this catalog. For Federal Specification paints, Industrial Finishes and other paints, ask your U.S.G. representative for recommendations, colors, etc.)

2.2 colors

Colors of paints shall (match control samples) (match color chips specified) (be as scheduled).

2.3 tinting and mixing

Paints shall be tinted and mixed to specified colors using COLORTREND Colorants and delivered ready-mixed to job site.

Part 3: execution

3.1 surface preparation

- **a.** Before painting, prepare surfaces as required in product directions. The base surface must be sound, firm and dry, clean and free of dust, dirt, grease or other foreign material.
- b. Interior Plaster Surfaces—on old plastered walls, fill all hair-line cracks with DURABOND Spackling Putty. Fill larger cracks with DURABOND Patching Plaster. Finish rough edges and allow time for spackled and filled areas to dry. Dull the glossy areas by rubbing lightly with fine steel wool or washing with a strong washing powder solution followed by a thorough rinse with clean water. Allow to dry before proceeding. Touch up the spackled and patched cracks and areas with TAL Latex Undercoater. Allow to dry. Follow with a full coat of TAL Latex Undercoater. On newly plastered walls (when fully cured), use USG LIME LOCKER Sealer for plaster.

- c. IMPERIAL Veneer Plaster Surfaces—proper sealing of surface is essential. Surface must be sound and dry as outlined above; repair minor imperfections with DURABOND Paste Spackling Compound or USG Ready-Mixed Joint Compound-All Purpose. When dry, apply one or more coats of USG LIME LOCKER Sealer. Tint the primer-sealer coat to aid in detection and repair of surface defects; seal any patches or fills revealed after first primersealer application. Either water-thinned or solvent-thinned flats or enamels may be used for finish coats.
 - d. Interior Gypsum Panel Surfaces-prepare joints and fastener heads with (USG) (DURABOND) Joint Compound (see Specifications in U.S.G. Folder SA-927).
 - e. Interior Wood Surfaces (except floors)—for new wood not previously painted, sand smooth and touch up knots, sap streaks and pitch spots with shellac.
 - f. Interior Metal Surfaces-remove grease, oil and plaster spatterings, rust and mill scale. Prime cleaned metal with (one) (two) coat(s) of a good grade metal primer.

3.2 application

a. Apply finishes according to product directions. Finishes must be evenly spread and free from runs, sags and other blemishes. Allow all coats to dry before applying following coats. On enamel and varnish finishes, smooth lightly and remove dust between coats.

Note to architect: Where more detailed specification is desired, select from specialty applications shown below.

- b. SHEETROCK Brand W/R Gypsum Panels—seal W/R Gypsum Panels with TAL Latex Undercoater or an alkyd semi-gloss enamel as prime coat. Lightly sand any rough areas before applying finish coats.
- c. To improve fastener concealment where gypsum panel walls and ceilings will be subjected to severe artificial or natural side lighting and be decorated with a water-based paint, apply a good quality alkyd (oil) based primer/sealer prior to decoration. However, when using this procedure, care should be taken to avoid roughening the surface paper if sanding is used to smooth the joint compound. For priming and decorating, follow manufacturer's directions for materials used.

d. IMPERIAL QT Spray Texture Finish

- 1. All surfaces, including joint compound applications, spackling or patching treatments, shall be dry, clean and sound. Remove any water-soluble materials from surface. Dull or roughen any glossy surfaces. Prime all metal surfaces with a rust-inhibitive oil primer. Fill and seal any exposed wood surfaces.
- 2. Allow new concrete ceilings and any new concrete patches or repairs to age at least 60 days before applying IMPERIAL QT Finish. Remove form oils, efflorescence, grease and other deposits from all concrete surfaces. Finish any patched or repaired areas to provide a uniform texture and surface.

Grind down any ridges or other protrusions resulting from forms or other causes to the same level as adjacent surfaces; remove all grinding sludge or dust. If filling is required, apply a DURABOND Joint Compound, COVER COAT Drywall Compound, TAL Super Block Filler or USG R/M Smoothcoat and Texture. Apply in as many coats as are needed to provide a level crack-free fill without edge joinings that show through decoration.

- 3. Exercise special care to provide a smooth level surface, free of irregularities, in areas which will be exposed to sharply angled lighting.
- 4. In drywall construction, treat joints and fastener heads with a joint system manufactured by the United States Gypsum Company, following manufacturer's instructions. Smooth and spackle any scratches or scuffs in drywall surfaces.
- 5. When all surfaces are prepared and dry, apply a full coat of a good-quality alkyd spray flat wall paint over entire surface. Allow
- 6. Mix IMPERIAL QT Texture Finish with water only as directed by manufacturer. Do not over dilute. Use spray equipment of a size and type to assure acceptable results. Apply by spray only at a coverage rate not to exceed 8 sq. ft. per lb. and/or in accordance with directions printed on container. Apply material to blend uniformly and cover fully without starved spots or other evidence of thin application. Provide uniform texture without application patterns. Remove any texture droppings or overspray from walls, windows and floor, leaving room clean for following trades.
- e. USG Exterior Gypsum Ceiling Board—before painting, finish panel joints, beads, trim, control joints and fastener heads with DURABOND Joint Compound and allow to dry (see Specifications, U.S.G. Folder SA-927). Apply one coat of a good-quality oil or alkydbased exterior primer, a good-quality alkyd, a latex-type exterior paint, or an interior spray texture finish and allow to dry. Finish with one or two coats of Tal Vinyl-Acrylic Latex House Paint, or sprayapply DURACAL Exterior Spray Texture Finish.
- f. Metal Surfaces—apply a good grade metal primer (brush) (roller) (spray). Recoat in two hours or after overnight drying, applying second coat at right angles to first to assure total coverage.
- g. Acoustical Tile, Panels and Plasters—paint acoustical ceilings only after surfaces have been properly vacuum cleaned. Spray-apply TAL Latex Wall Paint or Latex Semi-Gloss or Eggshell Enamel in white or light tint as specified. TEXOLITE Standard may be used on acoustical tile. Thin with water prior to spraying. Use standard spray atomizing equipment with sufficient fluid and pressure for light uniform coverage. Avoid piling up paint at laps, joinings, or elsewhere. Dust paint in allernating fashion from both sides of raised texture.

NOTE: When sanding, ventilate, use dust collector, or wear eye protection and a respirator approved by the U.S. Bureau of Mines or equal.

Note: All products described here may not be available in all geographic markets. Consult your local U.S.G. sales office or representative for information.

Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, TEXOLITE, CEMENTICO, DURACAL, IMPERIAL, TAL, SHEETROCK, TEXTONE, DURABOND, COVER COAT, LIME LOCKER.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAM-AGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

U.S.G. Sales Offices, Paint Division: Illinois: Chicago, 364-3423 · Massachusetts: Boston, 848-2730. Textures: Illinois: Chicago, 321-4121 . New York: Tarrytown, 332-0800 · California: Glendale, 956-1882 · Georgia: Atlanta, 393-0770.

ULTRAWALL partition systems

10.1/Uni

The most flexible and cost-saving partitioning for both new construction and existing buildings



system folder



Simplified beauty, easy maintenance, rigidity . . . meet changing needs quickly and economically

ULTRAWALL Partition Systems give new freedom to plan, control and enhance interiors. They permit earlier completion and occupancy in new construction—quick relocation of walls and utilities in existing buildings. Also, ULTRAWALL partitions cause the least disruption to normal work routines.

Engineered for fast installation and relocation.

ULTRAWALL partitions, installed only by licensed contractors, go in quickly and relocate quickly, resulting in significant savings in time. Components are quickly moved for rearrangement of space and/or utilities. In short, ULTRAWALL partitions never become obsolete.

Design simplicity is the reason. An ULTRAWALL partition has only four basic components: (1) a beveled-edge, noncombustible gypsum panel, (2) a ceiling runner, (3) a floor runner, and (4) a simple spline-stud 24- or 30-in. o.c. That's all there is. Yet ULTRAWALL partitions offer the appearance, rigidity and other advantages of fixed partitions.

Adapt quickly to changing requirements.

ULTRAWALL partitions give you total flexibility in meeting space alterations. You can add or delete partitions at any time. Revamp entire floors. Accommodate any changes quickly and at low cost.

Bank rail, cornice and ceiling height systems use the same basic components. They differ only in type and placement of studs. Systems work interchangeably—fit all standard ceiling grid modules, afford ample chase space for concealed wiring, standard-sized electric boxes and sound control blankets.

ULTRAWALL partitions allow erection on both sides or one side only to suit tenant needs. Individual panels are removable for ready access where needed. Beveled-edge panels are integrally kerfed to engage and conceal studs.

There's a wide choice of decorative panel surfaces. Easily-attached accessories for corners and windows. A choice of door frames (satin- or bronze-anodized aluminum, steel/vinyl covered or 3-pc. steel) to match other trim. Unique SMR aluminum frames in two styles reverse completely (right or left hand) even after installation.

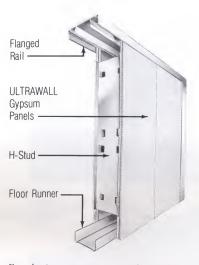
Hinge and strike locations adjust to premortised doors for quick attachment. Steel/vinyl covered frames reverse completely to meet changing needs. Extruded vinyl covers adapt frame to any desired hinge placement (see Specifications, page 19). Lastly, glazing components permit use of glass anywhere.

Major cost savings across the board.

ULTRAWALL partitions offer substantial cost savings in installation. Flooring, ceiling, lighting, core and perimeter are all completed first—before ULTRAWALL partitions are installed. This eliminates the time and cost of measuring and cut-fitting around partitions.

Finishing is another area of cost savings. With fixed partitions, chances are, finishing costs will be added to installation costs.

Tenants enjoy the great indoors thanks to the spacious environment provided by ULTRAWALL Partitions. And buildings stay productive and profitable because of the inherent versatility of ULTRAWALL Partitions, a versatility impossible with fixed partitions.



Four basic components provide simplicity in design, layout, estimating, erection, moving, reassembly and replacement. ULTRAWALL Partition construction covered by U.S. Patent Nos. 3,908,328; 3,986,313; 4,127,974; 4,154,035; 4,209,953; other patents pending.

ULTRAWALL Partitions permit easy addition of full glass windows, sidelights, windows and transoms whenever and wherever desired. Measuring a full 3%-in. thick, ULTRAWALL Partitions are as solid a partition as you could want.







ULTRAWALL Partitions never become obsolete. You can remodel offices, add or delete partitions at any time, revamp entire floors—accommodate any changes quickly, easily and inexpensively.

fire and sound ratings			
assembly description	test no.	fire rating	STC rating
Movable ULTRAWALL Partition—con- cealed H-studs 24" o.c.—steel runners— '4"x24" bevel edge ULTRAWALL gypsum panels—perimeter gaskets—joints unfinished wt 7 width 3%"	U of C(2) 8/18/67 BBN-701008(1)	1 hr.	42
Same construction as above except with ¾"x30" ULTRAWALL gypsum panels	U of C(2) 7/23-69	1 hr.	
Same construction as above except with ¾"x30" ULTRAWALL gypsum panels and aluminum ceiling runner	WJE(3) 12/29/70	1 hr.	
Movable ULTRAWALL Partition—concealed H-studs 24" o.c.—steel floor runners —painted steel ceiling runner with interior tabs—3/4" x24" bevel edge ULTRAWALL gypsum panels—joints unfinished wt 7 width 3%"	WHI-120/121(7)	1 hr.	
Same construction as above except with ARL-300 aluminum ceiling runner	WHI-495 -0225/0226(7)	1 hr.	
Movable ULTRAWALL Partition—concealed H-studs 24" o.c.—1" THERMAFIBER sound attenuation blankets—34"x24" bevel edge ULTRAWALL gypsum panels—perimeter gaskets—joints unfinished wt 7 width 3%"	BBN-701216(1)		47
Movable ULTRAWALL Partition—concealed H-studs 24" o.c.—1½" THERMAFIBER sound attenuation blankets—¾"x24" bevel edge ULTRAWALL gypsum panels one side—double layer opposite side with ¾" Z-runners between layers—joints unfinished—perimeter caulked—painted wt 12 width 4½"	UL Des U416(5) TL-70-198(4)	2 hr.	50
Movable ULTRAWALL Partition—concealed T-studs both sides 24" o.c.— 4"x24" bevel edge ULTRAWALL gypsum panels—joints staggered and unfinished —perimeter caulked wt 8 width 3%"	TL-70-252(4)		40
Same construction as above with 11/2" THERMAFIBER sound attenuation blankets wt 8 width 33/4"	TL-70-251(4)		48
Movable ULTRAWALL Partition—con- cealed H/R-studs both sides 24" o.c.— %"x24" bevel edge ULTRAWALL gypsum panels—joints unfinished—perimeter gaskets wt 7 width 3%"	USG-750206(6)		40
Same construction as above with 1½" THERMAFIBER sound attenuation blankets wt 7 width 3%"	USG-740909(6)		46
Door/Door Frame Assembly—4'0"x10'0" SMR DELTA frame in ULTRAWALL Partition —full height opening—snap-in header, ARL-300 rail—jambs attached to rail with	WHI-2986(7)	20 min.	
F-clips—wood (mineral core) door Door/Door Frame Assembly Side Light— 4'0"x10'0" SMR DELTA frame in ULTRAWALL Partition—same construction as above except double struts on hinge side —2'x10' (nom.) side light—AGL-340 jamb attached to wall with DURABOND 90 adhesive—AGL-341 snapped into ARL-300 head and DELTA jamb—four ³ /16" bolts through jamb—AGL-345 sill—2" wired glass	WHI-2996(7)	20 min.	
Door/Door Frame Assembly—Two Side Lights—3'0"x10'0" SMR DELTA frame in ULTRAWALL Partition— 2'x10' (nom.) side lights each side of frame—same construction as above except no studs at jamb section	WHI-3318(7)	20 min.	
Door/Door Frame Assembly—4'0"x10'0" Steel/Vinyl Door Frame Assembly in full heigh ULTRAWALL partition—concealed H-studs— steel jambs attached to partition with 11/4" Type S screws 18" o.c.—steel ceiling runner over door opening filled with THERMAFIBER insulation—vinyl snap-in header—mineral core wood door	WHI-0249(7)	20 min.	

(1) Bolt, Beranek & Newman (2) University of California (3) Wiss, Janney, Elstner & Associates (4) Riverbank Acoustical Laboratories (5) Underwriters Laboratories Inc. (6) United States Gypsum Acoustical Research Facility (7) Warnock Hersey International. Sound tests are conducted per ASTM procedures.

There are no add-on finishing costs with ULTRAWALL prefinished, vinyl-covered partitions. Installation means completion.

Similar savings occur with every remodeling, every space real-location. For commercial, industrial and institutional clients beset with frequent space alterations, the cost savings of ULTRAWALL partitions can be significant.

Moveover, you can reuse ULTRAWALL partitions. There's virtually no waste. And maintenance is minimal. ULTRAWALL vinyl-surfaced panels seldom need cleaning, never need repainting. Also, the trim for glazing and door frames may be extruded, anodized aluminum for even more maintenance advantages (see steel/vinyl trims available as option).

Offer important tax savings.

ULTRAWALL partitions, unlike fixed partitions, are not classified as a structural part of the building. Instead, they are classified as personal property. This makes ULTRAWALL partitions eligible for a 10% investment tax credit on their initial cost. It is a tax reduction, not a deduction.

In addition, ULTRAWALL partitions as personal property may be depreciated over a shorter time using a full accelerated depreciated method.

Consult corporate tax accountants or an outside accounting firm about these financial advantages of ULTRAWALL partitions.

Uncommon elegance to enrich any floor plan.

ULTRAWALL partitions are engineered for better design esthetics. The flush-mounted panels present a smooth-faced, permanent partition appearance. There are no exposed studs, no visible fasteners. And no battens.

Woodgrained vinyl facings may be chosen to lend distinction

and beauty. Or dramatic colors and deep-textured patterns can be selected for an image of richness and importance. Crisp, bright pastels are available to impart a modern, clean-lined look. Easily installed glazing elements contribute a spacious appearance.

With ULTRAWALL partitions you have freedom to control the tone and atmosphere of building interiors.

Higher fire and sound ratings without any additions.

Most other movable partitions need special studs or extra fireresistant insulation to meet the required 1-hour fire rating. But not ULTRAWALL partitions. Both 24- and 30-in. panels in floor-toceiling height assembly carry a 1-hour fire rating without any extra insulation (see test data at left). Moreover, the 24-in. panel assembly with sound attenuation blankets and second layer of panels offers a 2-hour fire rating.

Sound control is also built into every ULTRAWALL partition. The basic system offers a 42 STC (Sound Transmission Class) rating. This assures the acoustical privacy essential to work efficiency. Most other movable partition systems require the addition of extra materials (and extra cost) to achieve so high a rating.

For stringent acoustical conditions, ULTRAWALL partitions can be equipped with sound attenuation blankets to achieve a 48 STC rating. When even higher sound requirements are demanded, there are ULTRAWALL partitions with double panels which offer a 50 STC rating.

limitations

- 1. Non-load bearing.
- 2. Not recommended where exposed to excessive moisture.
- 3. Limiting unrestrained length between supports of Cornice Height Partitions, including those with door openings joined by



The predecorated vinyl elegance of ULTRAWALL Partitions enhances any office setting. An extensive choice of patterns and colors offers a wide range of contemporary wall fashions.

ULTRAWALL Partitions muffle distracting noises, yet "open up" offices with floor-to-ceiling glazing. Floor covering can be installed before ULTRAWALL Partitions go up, a major cost savings. The same is true for lighting, the ceiling and perimeter finishing. Every time space is reallocated there are further cost savings.









continuous top rail, must not exceed 15 ft. Solid core doors must not be used in Cornice Height Partitions over 10 ft. long. For greater rigidity, vertical support spacing should be reduced to 10 ft. or supplementary supports installed per U.S.G. recommendations. Aluminum top rail butt joints are to occur only at vertical supports.

4. Limiting unrestrained length between supports of Bank Rail Partitions having continuous top rail must not exceed 15 ft. Longer runs require rail struts or intersecting partitions at 15 ft. intervals. For greater rigidity, vertical support spacing should be reduced to 10 ft. or supplementary supports installed per U.S.G. recommendations. Aluminum top rail butt joints are to occur only at vertical supports. Rail struts also required at terminals, swinging gates and max. 10-ft. intervals on free-standing partitions. When bank rail is installed over lightweight concrete floors, L- or T-intersections are recommended at free-standing terminals and at 15 ft. intervals.

	Stud Spacing o.c.				T-Studs		H/R-Studs	
	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm
Max. Code	24	610	13-6	4120	12-6	3810	11-9	3580
Limits(1)	30	762	12-6	3810	11-6	3510	11-0	3360
Recommended	24	610	10-9	3280	10-9	3280	9-6	2900
Limits(2)	30	762	10-3	3120	9-6	2900	9-0	2750

5. Limiting heights for Ceiling Height Partition:

(1) Maximum limits based on L/120 allowable deflection and 5-psf uniform load.
(2) U.S.G. recommended limits for most acceptable rigidity. Limits based on L/240 deflection, 5-psf uniform load and human response to flexing.
Note: Heights above U.S.G. recommendations may be satisfactorily obtained with additional

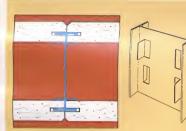
Note: Heights above U.S.G. recommendations may be satisfactorily obtained with additional structural support. See U.S.G. representative for specifics.

6. Limiting height for Bank Rail Partition: 5 ft.-0 in. (1.53 m).

Three interchangeable systems— Each offers special advantages

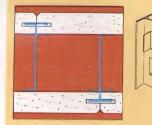
Each ULTRAWALL partition assembly provides major advantages in simplicity, low cost and design features. Each gives maximum versatility with economy and easy installation. Systems can be interchanged in the same installation (see below) to provide accessible panels only where needed. The only variable is the stud.





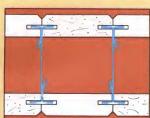
Standard H-Stud System

One of the fastest, simplest movable partitions—outstanding for low cost. The system is assembled, dismantled and reassembled quickly. And because accessibility usually is not required for most buildings (electricians and other trades quickly make changes without removing panels), this ULTRAWALL system is virtually without equal. For quickest installation and lowest in-place cost of the three ULTRAWALL assemblies, specify the standard H-stud system.



T-Stud System

Allows erection of one side of the partition only, if desired. This permits completingithe partition after adjoining space is leased, allowing the tenant to select his own surface covering. Additionally, when considerable electrical work is to be installed, it is simpler to leave the partition semi-finished, allowing other trades to complete their work before the second side is enclosed. T-studs may be interchanged with H/R or H-studs. An outstanding choice for tenant or service walls.



H/R-Stud System

Provides access with full security. Opposite panels cannot be removed, yet alternate panels are easily removable and replaceable, providing future access to each cavity. H/R-studs snap in place—give the same speedy installation as H-studs. They can be used for a single panel, a series or an entire installation. All other components remain the same; only the stud is changed.

Colorful, durable vinyl-faced panels

ULTRAWALL Gypsum Panels are available in seven factory-applied vinyl facings-pumice, suede, sandalwood, woodgrain, cork, linen and textile. Panels are classified in two color groups-Standard and Accent-for further choice of availability. All vinyl-faced panels meet Fed. Spec. SS-L-30D, Type III, the gypsum base panel, ASTM C36. Group III Textiles meet Tackboard Surface Performance Specifications established for URBS usage. Within normal gypsum board limits, they may be considered a satisfactory tackable surface. Textile vinyl fabric meets Fed. Spec. CC-W-408A, Type I (Light Duty).

For large samples of decorator vinyl patterns and colors, request Swatch Book MP-437.

TEXTONE Vinyl Wallcovering, supported film $54^{\prime\prime}$ wide, with 1.4oz. per sq. yd. cotton-sheet backing, is offered separately in limited quantities to provide a commercial match with ULTRAWALL Panel colors and textures on adjacent walls and columns. Available in rolls of 30 lin. yds.

attern	value	pattern	value
umice			
Adobe	53	Marigold	41
Desert Sand	41	Caramel	20
Bone	61	Terra Cotta	21
Shell	73	Raisin	12
suede			
White Frost	64	Summer Shore	48
Old Ivory	61	Fawn	28
andalwood			
Vheat	64	Camel	45
Birch	57	Toasted Honey	37
voodgrain			
Royal Oak	25		
Natural Pecan	15		
cork			
Pearl Gray	60		
Saddle Tan	37		
linen			
Pewter	56	Autumn Rust	31
Straw	56	Forsythia	60
Champagne	60		
textile			
Chalk	50	Burnished Gold	32
Parchment	43	Burnt Orange	18
Mist White	63	Ginger	12

(1) Average values, Baumgartner Integrating Sphere Reflectometer

surface burning characteristics (1)

TEXTONE panel pattern	film thick.	flame spread	fuel contrib.	smoke dev.	vapor perm.
pumice	6	20	20	10	0.8
suede	6	15	10	25	0.6
sandalwood	5	15	20	10	0.8
woodgrain	6	20	5	15	0.6
cork	6	20	5	15	0.8
linen	8	20	5	60	0.5
textile	wt. 10.7 oz./yd²	25	10	65	1.0

(1) Tested in accordance with ASTM E84-80 by Southwest Research Institute.

Ranges listed in ascending cost range

Range A (6 mil.)

Pumice standard



Adobe-US-203

Desert Sand-US-205

Pumice accent





Terra Cotta-US-207

Marigold-US-204

Range B

Sandalwood standard (5 mil.)





Wheat-233749

Birch-206563

Suede standard (6 mil.)





White Frost-US-220

Range C (8 mil.)

Linen standard





Champagne-108400

Straw-735900

Range D (10.7 oz. per sq. yd. including non-woven fabric backing.)

Textile standard

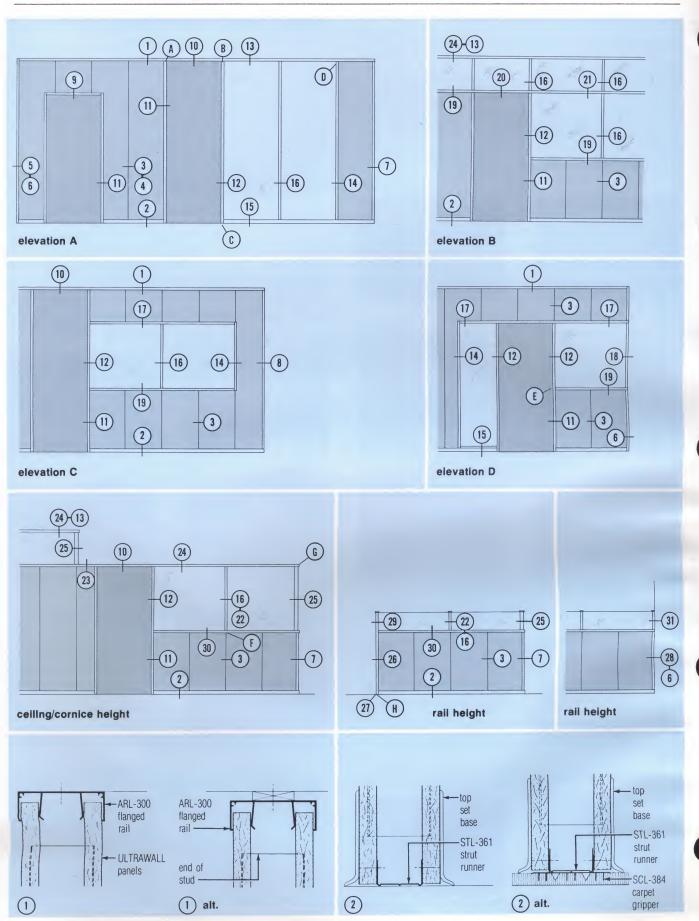


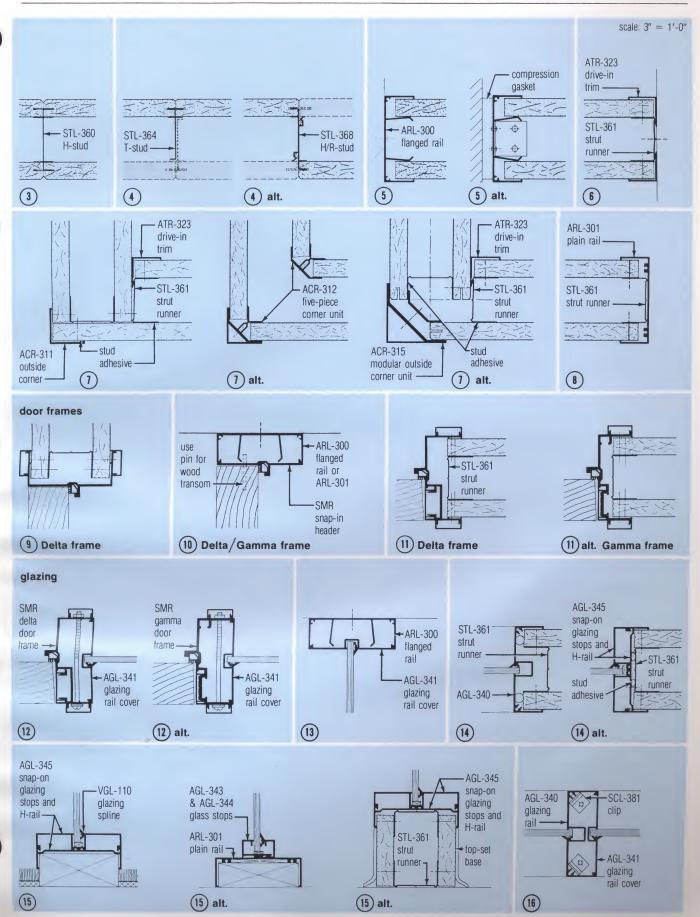


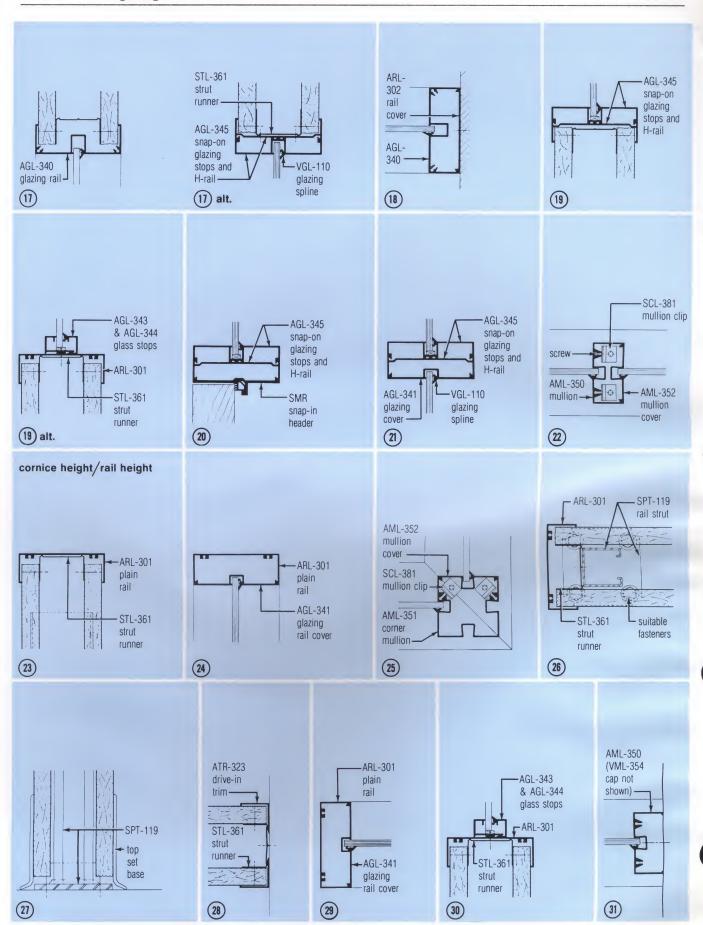
Mist White-51100

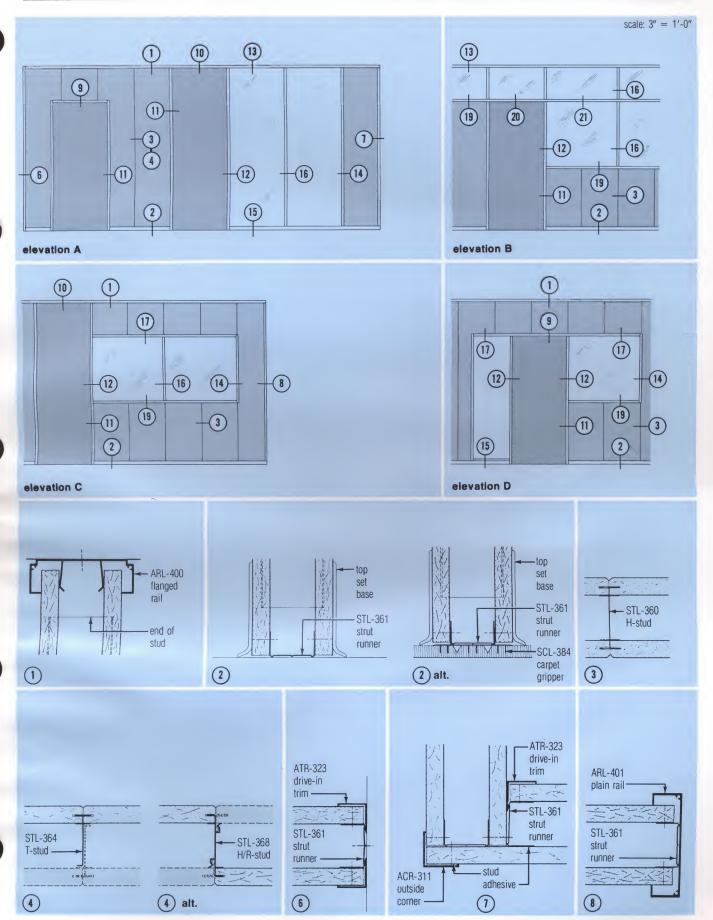
Parchment-50700

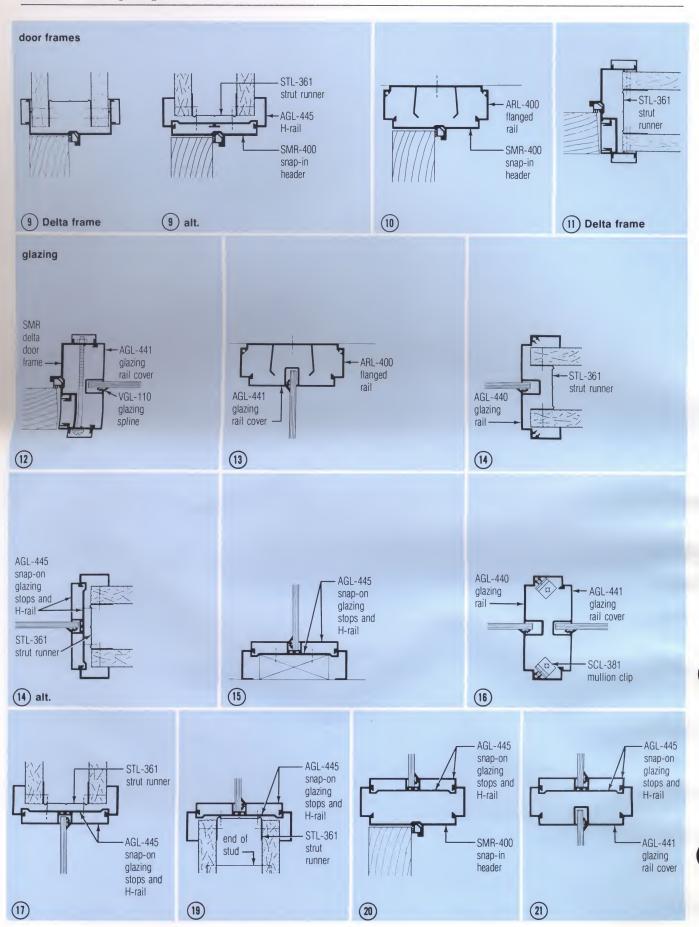


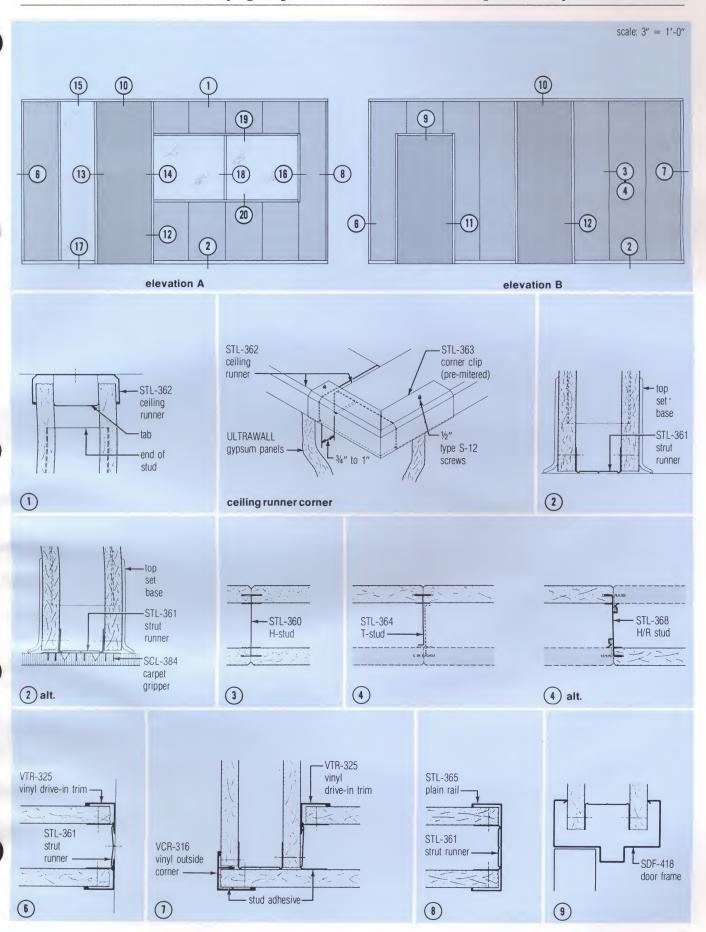


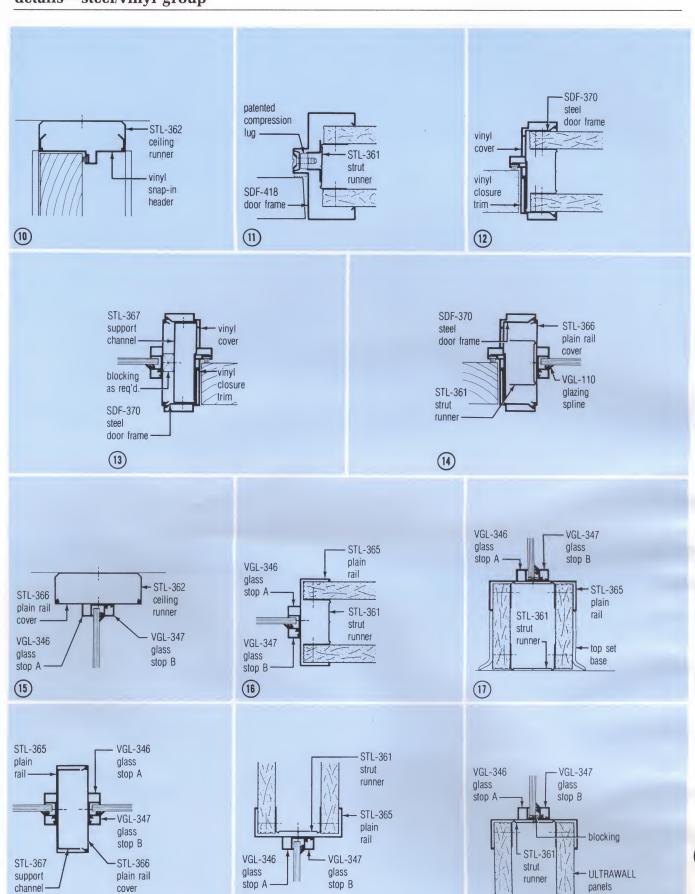








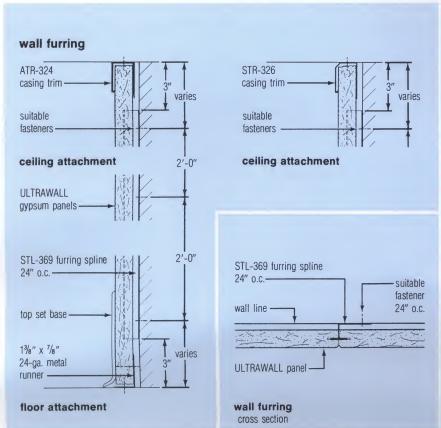


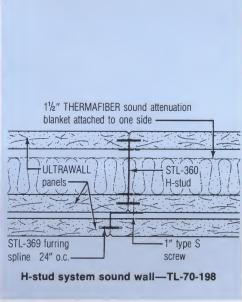


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(19)

18





fixture attachment data

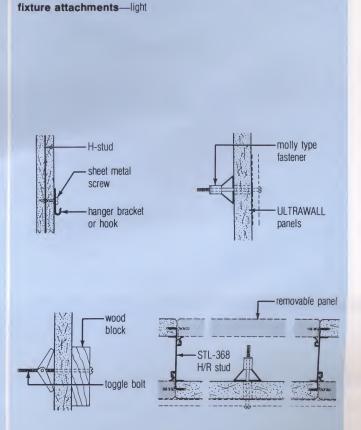
fastener loads

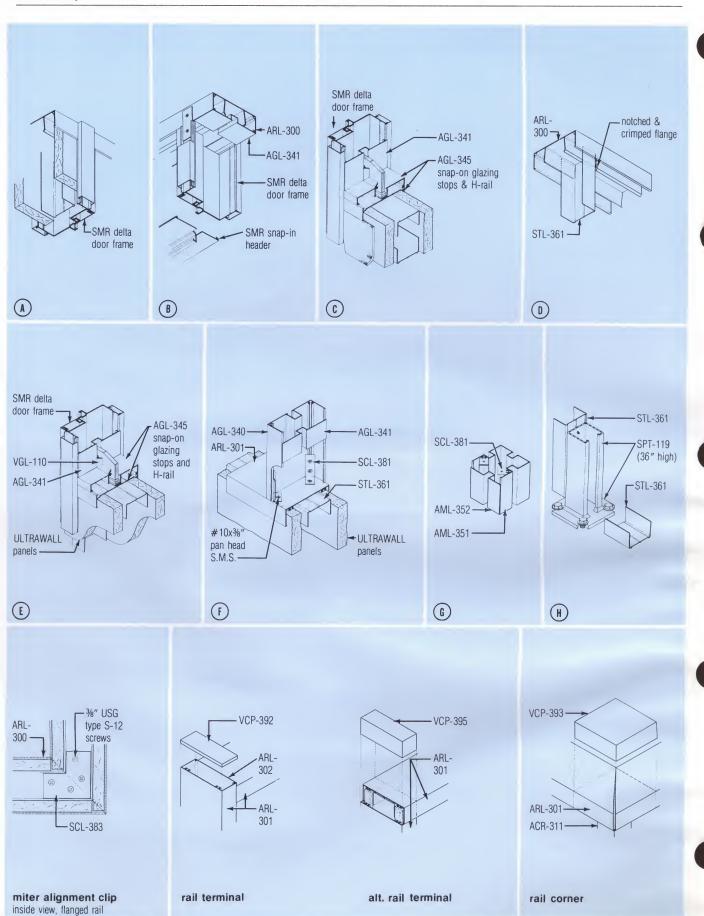
fastener type and	allow. withdr resista	allow. shear resistance		
attachment	lbf	N (1)	lbf	N (1)
Type S screw into H, T or H/R-stud (2)	100	445	100	445
#8 s.m. screw into H, T or H/R-stud (2)	80	356	100	445
1/4" (6.35 mm) molly bolt into panel only (3)	40	178	80	356
1/4" (6.35 mm) toggle bolt into panel only (3)	40	178	60	267

partition load capacity

attachment	max. load	max, load both side		
system	lbf	N (1)	lbf	N (1)
Type S screw into H or H/R-stud (2)	350	1557	500	2224
	per stud	per stud	per stud	per stud
Type S screw into	350	1557	350	1557
T-stud	per stud	per stud	per stud	per stud
1/4" (6.35 mm) molly or toggle	250	1112	250	1112
bolt into panel with H-studs(4)	per panel	per panel	per panel	per pane
1/4" (6.35 mm) molly or toggle	125	556	125	556
bolt into panel with H/R-studs (4)	per panel	per panel	per panel	per pane

(1) Newton. (2) Screws driven into fixed member of H/R-stud. (3) Not recommended for access panels with H/R-studs. (4) Attachment located at vertical centerline of panel.





good design practices

1. Door Frames—The USG SMR Aluminum Door Frames, both Delta and Gamma styles, are available with a snap-in header (2-pc.) for ceiling-height openings or milled header and mitered snap-on trim (3-pc.) for door-height openings. SMR Gamma also available in throat sizes from 3½" to 4½".

Both SMR frames are self-mortising and reversible. They include snap-in mortise closures, vinyl door mute, aluminum snap-in strike plate, hinge-attachment screws and adjustable hinge back-up plates (Delta only). Available in satin anodized and ULTRABRONZE finishes. They are designed for hollow core and solid core doors in 1¾" thicknesses only.

USG SDF-370 Steel Door Frames are available with snap-in header for ceiling height openings and with mitered header for door height openings, up to 10', designed for 134" thick hollow and solid core doors, and are completely reversible, suitable for 4" or 4½" standard template hinges, and 2¾" or 4½" standard strike. Hinges may be located anywhere. They consist of extruded vinyl jamb covers which snap over steel jambs and extruded vinyl header. The vinyl has an integral dark bronze color to match other steel/vinyl components.

USG SDF-418 Steel Door Frames come in three pieces and are complete with mitered frame shipped knocked down for 1¾" hollow core doors only. Standard frame is 3x7 ft. with dark bronze paint finish. Jambs are reinforced for three 4½" high by 4" or 4½" wide, full mortise, standard weight template hinges and an ANSI A155.1 universal 4½" strike. Nonstandard hinge and strike locations are not available. Doors selected for SDF-418 frames should not exceed 75 lb. max. Jambs must rest on solid flooring or shims.

- 2. Control Joints—The perimeters of movable partitions should be isolated from all structural members (except floor), and dissimilar wall or ceiling surfaces where structural movement may occur.
- 3. Seismic Design—In certain areas where seismic design code requirements govern, consult local building codes for partition limitations.
- 4. Sound Control—Where this partition is used as a sound barrier, the use of USG Acoustical Sealant is recommended to seal all cut-outs, such as at electrical fixtures and to seal all intersections with the adjoining structure. Eliminate cutting holes back to back and adjacent to each other.

The addition of THERMAFIBER Sound Attenuation Blankets to the stud cavity, pressed tightly in place, stapled to the back side of one face or partition, will increase the sound transmission loss of the partition.

- 5. Fixture Attachment—Lightweight fixtures and trim should be installed using plastic plugs or other expandable anchors for screw attachment. Medium and heavyweight fixtures should be supported from the primary framing.
- 6. Electrical Fixtures—The depth of electrical boxes should not exceed $2\frac{1}{2}$ ". Standard conduit and boxes may be used.
- 7. Additional Information—See U.S.G. technical folders in this series and in Sweet's General Building File: Construction Selector SA-100 for fire and sound-rated systems; Texture and Paint Products Folder SA-933 for finishing product specifications; TEXTONE Gypsum Panel Folder SA-928 for vinyl colors and patterns.

architectural specifications

Part 1: general

- 1.1 scope—Furnish and erect ULTRAWALL Partitions as indicated on the plans and specified hereunder.
- **1.2 description of systems**—Partitions shall be flush-panel type, 3%" thick, (railing, cornice, and/or ceiling height).

1.3 qualifications

- $\boldsymbol{a}.$ Installation of ULTRAWALL Partitions shall be by a U.S.G.-licensed contractor.
- **b.** All materials included herein, except as noted, shall be supplied by United States Gypsum Company.
- 1.4 submittals—The partition contractor shall submit shop drawings showing partition construction details.
- 1.5 delivery and storage of materials—All materials shall be delivered in their original unopened packages. Materials shall be stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

Part 2: products

2.1 materials

- a. Gypsum Panels—ULTRAWALL Panels (plain) (vinyl-faced—specify color) 3/4" thick by (24") (30") wide by appropriate height.
- **b. Studs**—Roll-formed galvanized steel (one piece H-stud) (one-piece T-stud) (three-piece H/R stud).
- **c.** Floor Runners—Roll-formed galvanized steel to hold panels in alignment.
- **d. Ceiling Runners**—One-piece extruded aluminum, or roll formed steel runners with formed-in spacers, and integral trim to conceal top edges of panels.
- e. Z-runners—3/4" Z-runners for attachment of third layer of panels.
- f. Door Frames—USG Aluminum Door Frames (two-piece) (three-piece), (SMR-reversible Delta) (SMR-reversible Gamma), (bronze-anodized aluminum). USG Steel Door Frames (SDF-370) (reversible two-piece), (reversible three-piece) (SDF-418, in three-piece, 18 ga. (right) (left) swings).
- g. Doors—Wood doors, 1¾" thick, (size) (left-hand opening) (right-hand opening) (Doors not by U.S.G.)
- h. Window Frames—Sized as shown on plans and assembled from standard extruded aluminum parts or pre-coated steel and vinyl components. Glass furnished by (partition contractor) (glazing contractor).
- i. Aluminum Trim—(Exposed trim members are etched and anodized with a permanent satin finish—AA-C22-A21) (ULTRABRONZE color-anodized aluminum—AA-C22-A32), (steel/vinyl trim available as an option).

Part 3: execution

3.1 partition erection

- a. Studs and Runners—Lay out the partition. Securely attach floor and ceiling runners. Accurately plumb strut studs at door openings and ULTRAWALL terminals.
- b. Gypsum Panels—Install ULTRAWALL Panels, steel studs and trim members in accordance with United States Gypsum Company's installation directions.
- c. Workmanship—Erect partitions so as to be rigid, plumb, with horizontal lines leveled, neat in appearance, and free from defects in workmanship. Conceal all connections to walls, floors, ceilings, cornice sections, and connections between gypsum panels. (Adjust all hardware to proper working order.)



Trademarks: The following trademarks used herein are owned by United States Gypsum Company: USG, THERMAFIBER, ULTRAWALL, TEXTONE, DURABOND, ULTRABRONZE. SMR is Reg. U.S. Pat. & Tm. Off. by Modulex, Inc.

Note: All products here may not be available in all geographic markets. Contact your local U.S.G. sales office or representative for information.

Notice: WE SHALL NOT BE LIABILE FOR INCIDENTAL AND CONSEQUENTIAL DAM-AGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

UNITED STATES GYPSUM 101 South Wacker Drive, BUILDING AMERICA

Chicago, Illinois 60606

description and utility

THERMAFIBER Mechanical Insulation is composed of spun mineral fibers processed into a choice of three different types: *felts* of various dimensions and densities; *pellets* for pouring or pneumatic application, and rigid *blocks* for high-temperature boilers and vessels. These insulating products are permanent and low-cost. Compared with many other types of insulation, they are superior in resistance to heat transmission and offer greater density and resiliency.

Noncombustible

Mineral fibers used in Thermafiber Mechanical Insulation will not burn or support combustion, are rated noncombustible (in accordance with NFPA definition when tested per ASTM E136), and will not melt until the temperature exceeds 2,000°F. per ASTM C24 test procedure. Not for service operation at this temperature. Refer to the appropriate Thermafiber literature which states the recommended maximum service temperature limits of individual products.

Surface burning characteristics are: flame spread 15, fuel contributed 0, smoke developed 0. Classification applies to THERMAFIBER Insulation in thicknesses 1" to 8" and greater, all sizes up to 60"x48", and all densities from 2.5 to 14 lb. per cu. ft. UL labels available upon request.

Dimensional Stability

THERMAFIBER Insulation tested at 1,200°F. showed less than 2% shrinkage of felts and no fusing of fibers. K-Fac® 19 High-Temperature Block after 24-hr. exposure at 1,900°F. showed a maximum 2.50% linear shrinkage, K-Fac SR High Density Semi-Refractory Felt 2% at 1,900°F.

Vermin Proof

THERMAFIBER Mechanical Insulation will not sustain vermin in any form

types and functions

THERMAFIBER insulating materials are well suited both for job-site assemblies and for factory-assembled units. Job-fabricated sound booths, sound rooms and curtain walls are examples of field installations which use THERMAFIBER Insulation in felt forms. Both felt and pellet or bulk forms are used in the manufacture of many types of boilers, ovens, coolers, ranges, etc. K-FAC 19 Block, however, typically is installed at the job site.



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new processes

U.S.G. recently pioneered a technologically advanced felt manufacturing process. Designed in Europe, the new process permits the manufacture of high-density insulating felts for operating temperatures to 1,900°F. U.S.G. is the only manufacturer in the United States using this process. Two major U.S.G. plants supply the new product. Additionally, two other U.S.G. mineral fiber plants have been expanded to help supply the urgent need for energy-saving insulation.

U.S.G. now offers industry one of the broadest lines of highefficiency mechanical insulation available anywhere. Specially developed to aid productivity and reduce costs, U.S.G.'s large diversity of insulation types, densities and temperature ranges allows the construction industry to target in on these vital objectives:

- fuel and energy conservation
- optimized industrial processes
- · reduced manufacturing and operation costs
- safety and comfort

new applications

Accompanying U.S.G.'s newly developed and highly versatile insulating products are new uses for these materials. Because of their high efficiency, easy workability and great temperature resistance, they readily replace less effective insulation. New applications include such areas as pipe covering, tank car installations and as an economical replacement for mineral fiber block. Working hand-in-hand with industry, U.S.G. mineral fiber specialists are providing effective answers to energy shortages and maximized productivity.

THERMAFIBER Industrial Felt

description

THERMAFIBER Industrial Felt is a high-melt point preformed insulation. Its low cost and high insulating efficiency make it ideal for a wide range of thermal, fire-protection and sound-control applications. With its fine-fiber, semi-rigid composition, THERMAFIBER Felt is easily handled and applied. It is nonadsorbent and corrosion-resistant; adsorbs less than 1% moisture; will not corrode steel or aluminum. Contains no asbestos.

uses

High melt-resistance and nine densities make THERMAFIBER Felt exceptionally versatile for commercial and industrial applications, in a wide range of low- to hot-surface temperatures. Included are thermal applications—commercial and industrial ovens, package boilers, dryers, walk-in freezers and coolers; fire-protective applications—metal fire doors, light fixture protection and ship bulkheads; sound-

control applications—metal partitions, sound booths and acoustical decks.

fire performance characteristics

Rated noncombustible, in accordance with NFPA definition. Melt point exceeds 2,000°F. per ASTM C24.

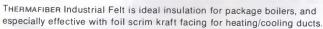
Not for service operation at this temperature. Refer to the appropriate product data or Thermafiber literature which states the recommended maximum service temperature limits of individual products.

Product withstands ASTM E119 temperature for over five hours when mechanically supported.

surface burning characteristics per ASTM E84

Flame spread 15, fuel contributed 0, smoke developed 0. Noncombustible as defined by NFPA and National Fire Code when tested per ASTM F136









desired cold-surface temperatures: Data on cold-surface temperatures for THERMAFIBER Felt used on ovens, furnace walls, etc., available upon request.

chemical state:

High melt-point mineral glass formulation.

maximum hot-surface temperature one side (enclosed panel) per ASTM C411

nom. density—pcf	max. °F.	nom. density—pcf	max. °F.
2.5	400	4.5	800
3.0	500	6.0	1,000
3.5	600	7.0	1,000
4.0	800	8.0	1,000
		9.0	1,000

Note: Temperatures above 450°F. require mechanical support.

specification compliance

		58B, ASTM C612		U.S. Coast Guard Specifications				
Form A Class 1	Form A Class 2	Form A Class 3	Form A Class 4	N&VI Circular No. 10-63	Standard 164.007/46/0 A-30	Standard 164.007/40/0 A-60	Standard 164.009/124/0	
X	X							
X	X						X	
X	X						X	
X	X	X	X		X(2)		X	
X	X	X	X	X(1)		X(3)	X	
X	X	X	X	` '		` ,	X	
X	X	X	X					
				Class 1	Class 1 Class 2 Class 3 Class 4 No. 10-63	Form A	Form A	

(1) 11/2" thick. (2) 2" thick. (3) 3" thick. Other specifications: All felts meet applicable analysis for chloride content on the basis of plot points for austenitic stainless steel per MIL-I-24244A.

physical data

nom. density—			avg. wt.—lb. /1000BF (2)		
	approx. density tolerances—pcf (1)	container size	sleeve or bag	ctn	
2.5	±0.5		250	290	
3.0	±0.5		300	340	
3.5	±0.5		340	380	
4.0	±0.5	per customer	400	440	
4.5	±0.5	specifications	450	490	
6.0	±0.75	'	570	610	
7.0	±1.0		680	710	
8.0	±1.0		780	800	
9.0	±1.5		840	860	

(1) On package weight basis. (2) For shipping information only.

thermal conductivity (1) per ASTM C177 or C518

	k-factor—btu · in./hr. · sq. ft. · °F.								
density—pcf	75°	200°	300°	400°	500°				
2.5	.27	.40	.51	_	_				
3.0	.26	.35	.45	_	_				
3.5	.26	.35	.44	_	_				
4.0	.25	.34	.42	.51	.60				
4.5	.25	.33	.41	.49	.58				
6.0	.24	.30	.38	.46	.56				
7.0	.24	.30	.37	.45	.55				
8.0	.23	.29	.35	.43	.53				
9.0	.23	.28	.34	.42	.51				

(1) Degrees represent mean temperature.

NRC data (1)

	1/3 00	tave bar	nd cente	r frequer	ncy—Hz		
specimen tested—pcf	125	250	500	1000	2000	4000	NRC
1" thickness							
4	.06	.24	.58	.81	.85	.90	.60
6	.07	.24	.62	.87	.91	.91	.65
8	.10	.31	.82	.97	.91	.89	.75
12	.09	.31	.77	.96	.99	.94	.75
2" thickness							
4	.24	.68	1.08	1.08	.99	.92	.95
6	.32	.81	1.11	1.09	1.02	.94	1.00
8	.35	.84	1.08	1.04	.96	.93	1.00
12	.40	.79	.78	.94	.94	.87	.85
4" thickness							
2.5	.63	1.15	1.15	1.05	1.05	.94	1.00
4	.77	1.14	1.15	1.15	1.04	.94	1.00
6	.84	1.11	1.11	1.05	1.05	.93	1.00

(1) Riverbank Acoustical Laboratories.

STC data (1)

nom. density—	thickness		
pcf	1"	2"	3"
	STC	STC	STC
4	_	8	14
6	6	12	16
8	10	15	18
10	12	18	23
12	11	20	26

(1) United States Gypsum Acoustical Research Facility.

sizes & availability from U.S.G. plants

	Birmingham, Ala. (1)			Corsicana,	Corsicana, Tex.		Wabash, Ind.(1)			Tacoma, W	Tacoma, Wash.		
density—pcf	min. thick.	max. thick.	width	min. thick.	max. thick.	width	min. thick.	max. thick.	width	min. thick.	max. thick.	width	
2.5	2"	6"	72"	2"	5"	90"	2"	6"	72"	2"	6"	89"	
3 & 3.5	2"	6"	72"	2"	5"	90"	2"	6"	72"	2"	41/2"	89"	
4 & 4.5	2"	6"	72"	2"	4"	90"	2"	6"	72"	2"	4"	89"	
3	11/2"	5"	72"	11/2"	21/2"	90"	11/2"	5"	72"	2"	3"	89"	
7 & 8	1"	4"	72"	11/2"	2"	90"	1"	4"	72"	2"	2"	89"	
)	1"	31/2"	72"	_	_	_	1"	31/2"	72"	_	_	_	

Note: Dimension tolerances—width $\pm \frac{1}{2}\%$, length $\pm \frac{1}{2}\%$, thickness $-\frac{1}{2}\%$, except Corsicana 6 lb. to 8 lb. $-\frac{1}{2}\%$, Tacoma, $-\frac{1}{2}\%$, ", 1) Aluminum foil-faced industrial felts are available from Birmingham and Wabash plants only, with densities and minimum thicknesses of: 4- & 4.5-pcf—2"; 6-pcf—1½"; 8-pcf—1"; 9-pcf—1".

THERMAFIBER X Industrial Felt

description

THERMAFIBER X Industrial Felt is resin-bonded mineral fiber felt insulation for use at service temperatures up to 1,350°F. At elevated temperatures, this high-density material (10- and 12-lb. densities) is more effective than glass fiber, more energy-efficient than conventional mineral fiber insulation and less costly than high-temperature block.

Highly workable, THERMAFIBER X Felt applies with outstanding ease and speed. It readily cuts, shapes and fabricates for quick completion of the installation project. Contains no asbestos.

uses

THERMAFIBER X insulation is ideal for a variety of hot surface applications, including ovens, boiler walls, dryers, ducts, precipitators, process tanks, breechings, and kilns.

fire performance characteristics

Surface burning characteristics: flame spread 15, fuel contributed 0, smoke developed 0, per ASTM E84. Noncombustible as defined by NFPA and National Fire Code when tested per ASTM E136.

maximum hot-surface temperature one side (enclosed panel) per ASTM C411

density-pcf	max. °F.	
10.0	1,200	
12.0	1,350	

specification compliance

Per ASTM C612 and HH-I-558B, Class 2, 3 and 4 (with the exception of linear shrinkage over 1,300 $^{\circ}$ F.).

average compressive strength

Per ASTM C165: 12 pcf—590 psf @ 10% compression, 10 pcf—460 psf @ 10% compression.

nonadsorbent, corrosion resistant

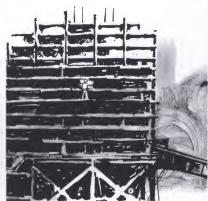
THERMAFIBER X insulation adsorbs less than 1% moisture. Won't corrode steel or aluminum, as tested per HH-I-558B.

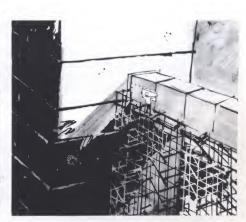
sizes and availability (1) (Birmingham, Ala. and Wabash, Ind.)

product density	min. thick.	max. thick.	std. size	approx. dens. tolerance —pcf	
10 lb.	1"	3"	24"x48"	± 1.5	
12 lb.	1"	21/2"	24"x48"	± 1.5	

(1) Packaging-paper bags, sleeves, cartons; heat-shrink poly.







THERMAFIBER BI Insulation

description

THERMAFIBER BI Insulation is a preformed mineral-fiber felt composed of high-temperature resistant fibers. Manufactured in three densities, BI Insulation is designed for hot-surface applications where lightweight, highly efficient insulation is desired. Contains no asbestos.

uses

THERMAFIBER BI Insulation effectively insulates boiler walls, precipitators, hot ducts, insulated panels, breechings and process tanks. . . can be used with steel or aluminum surfaces since it does not cause or sustain corrosion. Insulation thickness depends upon required hotsurface temperature, and desired outside surface temperature of insulation. Hot-surface temperature limits are 1,000° to 1,200°F. Mechanical support required above 450°F.

The BI Insulation Series, produced to rigid quality-control standards, provides long-lasting dependable service.

THERMAFIBER BI Insulation installs easily by impaling on studs or pins to form a tight joint, then finished as specified with a metal jacket, metal mesh and/or cement finish.

density

product designation	nom. density —pcf	approx. density tolerances—pcf(1)
BI-1	6.0	±0.75
BI-2	8.0	±1.0
BI-3	9.5	±1.5

(1) On package weight basis.

thermal conductivity (1) per ASTM C177 or C518

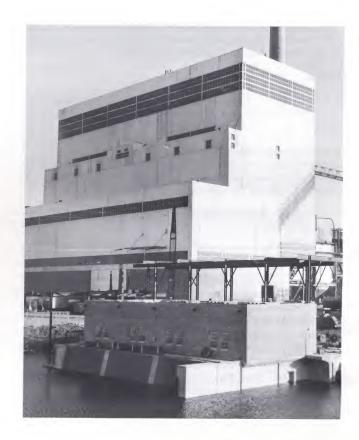
	k-factor—I	otu · in./hr. · sq.	ft. · °F.	
nom. density—pcf	100°	200°	300°	500°
6	0.26	0.30	0.38	0.56
8	0.24	0.29	0.35	0.53
9.5	0.24	0.28	0.34	0.51

(1) Degrees represent mean temperature.

hot-surface temperature limits—one side (enclosed panel) per ASTM C411(1)

nom. density—pcf	max. °F.	
6	1,000	
8	1,000	
9.5	1,200	

(1) BI Insulation requires mechanical support on hot surfaces above 450°F.



specification compliance

BI-1, 2 and 3 Insulation meet Federal Specification HH-I-558B, Form A, Class 1, 2, 3 & 4 and ASTM C262, ASTM C612, Class 1, 2, 3 & 4.

fire performance characteristics

Noncombustible as defined by NFPA and National Fire Code when tested per ASTM E136.

surface burning characteristics

Flame spread 15, fuel contributed 0, smoke developed 0 per ASTM E84.

sizes & availability from U.S.G. plants

		Birmingham, Ala.		Corsica	Corsicana, Tex.			Tacoma, Washington			Wabash, Ind.						
prod- uct	density —pcf	min. thick.	max. thick.	width	length	min. thick.	max. thick.	width	length	min. thick.	max. thick.	width	length	min. thick.	max. thick.	width	length
BI-1	6	11/2"	5"	24"	48"	11/2"	21/2"	24"	45"	2"	21/2"	24"	441/2"	11/2"	5"	24"	48"
BI-2	8	1"	4"	24"	48"	11/2"	2"	24"	45"	2"	2"	24"	441/2"	1"	4"	24"	48"
BI-3	9.5	1"	3"	24"	48"	_	_	_	_	_	_	_	_	1"	3"	24"	48"

Thicknesses available in 1/2" increments. Note. Dimension tolerances—width ± 1/6", length ± 1/2", thickness = 1/6 + 1/4" except Corsicana 6 lb. and 8 lb. is = 1/6" + 5/6"; Tacoma is = 1/6" + 5/6";

THERMAFIBER Metal Mesh Blankets

description

THERMAFIBER Metal Mesh Blankets are made from precisionpreformed mineral felt sandwiched between metal facings. The noncombustible blankets are flexible and can be cut and formed to curved surfaces and irregular shapes. Contain no asbestos.

uses

Widely used for insulating utility boiler breechings, ducts, precipitators, tank and vessel exteriors, cylindrical-surface refinery applications and other industrial equipment where an efficient and economical insulation is desired. Surfaces can be finished with cementitious coatings applied over metal lath facing for a strong, long-lasting finish.

THERMAFIBER Metal Mesh Blankets apply rapidly. On tanks, top end of blanket must be properly fastened to angles or clips welded on the vessel at appropriate intervals. Suitable expansion joints should be used for installations exposed to temperatures exceeding 600°F. Minimum ¾-in. bands, spaced 12 to 18 in. o.c. are used to secure blankets. Metal mesh facings of adjacent blankets are laced with wire. On flat surfaces, blankets are impaled over studs or pins, with blanket edges laced with wire.

thermal conductivity (1) per ASTM C177

k-factor-btu · in./hr. · sq. ft. ·	°F.
0.24 @ 100°F. mean temperature 0.29 @ 200°F. mean temperature 0.35 @ 300°F. mean temperature 0.53 @ 500°F. mean temperature	-

(1) Temperature limit on hot-surface side is 1,200°F. Not to be used at service temperatures above 1,200°F.

fire performance characteristics

Felts used for THERMAFIBER Metal Mesh Blankets are rated noncombustible as defined by NFPA and National Fire Code when tested per E136.

surface burning characteristics

Flame spread 15, fuel contributed 0, smoke developed 0 per ASTM E84.

physical data

product designation	type (1)	nom. density— pcf	approx. density tolerances—pcf(2)	thickness—	
MMB-1	1" hex wire mesh	8	± 1.0	1" to 6"	
MMB-2	both sides 1" hex wire mesh & metal lath	8	± 1.0	1" to 6"	

(1) Other facings and densities available on special order. (2) On package weight basis.

chemical state

High melt-point mineral fiber formulation.

specification compliance

HH-I-558B Form C Class 10 & 11; ASTM C592, Class II



sizes & availability

max. thickness	length	width	U.S.G plant
1" to 6" in 1/2" increments	48"	24"	Wabash, Ind.

Note: Product is packaged in cartons. Information on other sizes available on request.

THERMAFIBER Industrial Bulk Wool

description

Consists of heat-resistant mineral fibers in choice of granulated wool for hand pouring or mixing, and packing wool for hand packing. Economical and efficient for thermal control, acoustical correction and condensation control. Rated noncombustible per ASTM E136. Contains no ashestos

Granulated Wool consists of mineral fibers formed into small nodules or pellets. Fibers are air-cleaned and treated with dust-collecting oil. Also available in dry form (see below). **Uses:** can be used for hand-poured applications or mixed with other materials as a filler in insulating cements and foundry molds.

Dry Granulated Wool Same as granulated wool (above), but available in dry form (retained oil less than 0.17% by weight). **Uses:** thermal insulation for cryogenic tanks such as liquid oxygen (customer must specify dry granulated wool); industrial blowing wool is for pneumatic application.

THERMAFIBER Packing Wool Similar to THERMAFIBER Granulated Wool, but designed for hand packing rather than pouring or mixing. **Uses:** recommended for heat control in boilers, tanks, expansion joints and ovens where the shape of the insulation cavity precludes the use of felt insulation.

surface burning characteristics

Flame spread 10, fuel contributed 0, smoke developed 0 per ASTM E84. Noncombustible as defined by NFPA and National Fire Code when tested per E136.

availability

product designation	Corsicana, Tex.	Wabash, Ind.	Tacoma, Wash.	Birmingham, Ala.
Granulated	X(1)	X(1)	X	X(1)
#10 Granulated	X	X	X	X
Dry Granulated	X	X		
Packing		X		

(1) Baled wool also available.

specification compliance

THERMAFIBER Industrial Blowing Wool meets Federal Specification HH-I-1030B except for identification of R value.

THERMAFIBER #10 Granulated Wool meets U.S. Coast Guard Specification 164.009.



cryogenic application (Industrial Granulated Wool for cryogenic application) (1)

mean temperature		k-factor (2)
°F.	°C.	btu • in./hr. • sq. ft. • °F.
72	22	0.245
32	0	0.23
-112	-80	0.18
-256	-160	0.14

(1) Except for oxidizing materials for which Dry Granulated Wool must be used. (2) Installed density: 4 pcf.

physical and design data

	installed	k-factor—btu · in./hr. · sq. ft. · °F.			recommended max.		ava ud	
product designation	density pcf (1)	75°	300°	500°	700°	temp. one side—°F. (enclosed panel)	container size—cu. ft.	avg. wt. lb./bag.
	(Density varies	with packing	pressure—three	e random densit	ies shown.)			
Granulated.	4.0	.271	.438	.708	NA	800		30
Packing.	8.0	.265	.376	.564	.865	1,000	2.8	30
Dry Granulated	12.0	.274	.359	.538	.790	1,350		25
Industrial Spray Wool	NA	NA	NA	NA	NA	NA	2.8	30

NA—not applicable. Packing wools for hand packing, granulated wool for pouring, spray wool for machine application. (1) Example of typical field-installed densities.

K-FAC® 19 High-Temperature Block

description

K-FAC 19 High-Temperature Block provides excellent insulating qualities at low cost with high strength and very good workability. Strong and durable, it is composed of mineral fiber and selected mineral additives. An organic binder that will dissipate above approximately 475°F. is used for low-temperature handling. On initial start up only, heat rise should not exceed 15°F. per minute to allow binder to dissipate without excessive temperature rise. Thermal conductivity is not affected. An inorganic binder system allows K-FAC 19 Block to be used at service temperatures to a maximum of 1,900°F. on the hot surface of an enclosed panel. Density ranges from 16- to 20-lb. per cu. ft. to meet a variety of installation requirements. K-FAC 19 block repels surface water, and moisture absorption is negligible. Contains no asbestos.

uses

K-FAC 19 Block is widely used in applications on precipitators, dryers, ducts and breeching, utility boilers, furnaces, kilns, etc., where high-temperature insulating material is required. Not to be subjected to direct flame impingement.

Exceptional strength and easy handling allow use of large-size blocks to reduce labor costs. Material can be cut quickly by hand with knife or saw for fabrication and application on the job. Attachment is by impaling on pins or studs.

K-FAC 19 Block will not cause or sustain corrosion of steel or aluminum finishes.

thermal conductivity (1) per ASTM C177

k-factor—btu · ir	ı./hr. ⋅ sq. ft. ⋅ °F.		
500°	700°	900°	
0.64	0.79	0.94	

(1) Degrees represent mean temperature.

physical data

nom. density— lb./cu. ft.	compressive strength—psi at 10% com- pression	linear shrinkage, max./ 24 hr. at 1,900°F. (1)	modulus of rupture— psi min.
16-20	20	2.50%	100

(1) Not to be used at service temperatures above 1,900°F.

specification compliance

HH-I-558B Form A, Class 5. Meets acceptable analysis for corrosion resistance MIL-I-24244A. Meets ASTM C612, Class 5.

sizes & availability (1)

min. thick.	max. thick.	width	length
1"	4"	6, 12, 24"	36"
1"	4"	24"	48"

(1) Thicknesses from 1" to 4" in $\frac{1}{2}$ " increments. Thicknesses over 1" are laminated. Available in all sizes from Greenville, Miss. plant.





K-FAC SR High-Density Semi-Refractory Felt

description

K-FAC SR Semi-Refractory Felt provides high-temperature insulating properties with excellent workability and easy application. It is a selected blend of high-density mineral fiber with a resin binder. Does not contain asbestos.

Recommended for non-load bearing maximum hot-surface temperature applications to 1,900°F. one side (enclosed panel only) per ASTM C612. On initial start-up, heat rise should not exceed 15°F. per minute to allow the binder to dissipate without excessive temperature rise. Applies to initial start-up only. Thermal conductivity properties are not affected.

uses

K-FAC SR Semi-Refractory Felt performs effectively over a wide range of uses. It is especially suited to replace mineral wool block and calcium silicate insulation in many applications. Attachment is by impaling on pins or studs. Not to be used for load-bearing applications or subjected to direct flame impingement.

thermal conductivity (1) per ASTM C177 or C518

k-factor-btu	· in./hr. · sq. ft. ·	°F.		
300°	500°	700°	900°	
0.37	0.48	0.65	0.85	

(1) Degrees represent mean temperature.

physical data

compressive load to 10% deformation—psf (1)	linear shrinkage, max./24 hr. at 1,900°F. (2)	
520	2%	_

(1) Per ASTM C165. (2) Per ASTM C356.

specification compliance

HH-I-558B Form A, Class 5. ASTM C612, Class 5 (exception is compressive strength). Meets applicable analysis for chloride content on the basis of plot points for austenitic stainless steel per MIL-I-24244A.

sizes & availability (1)

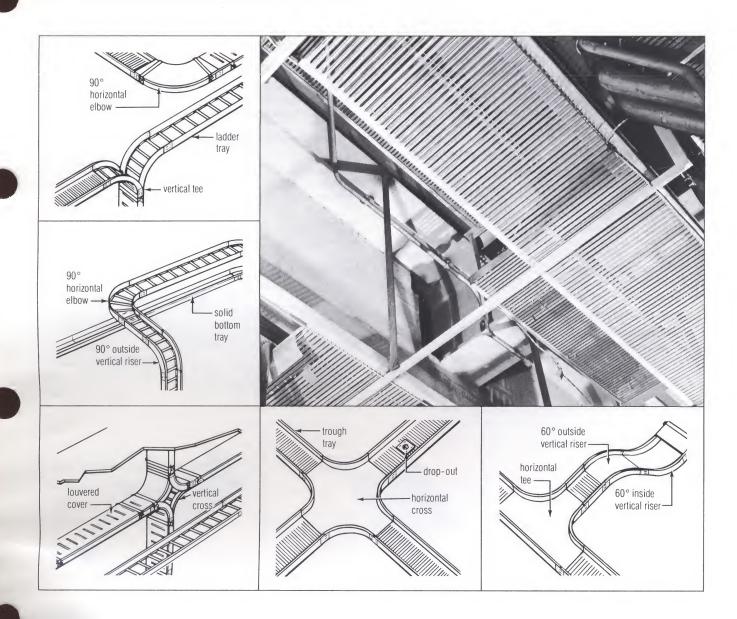
min. thick.	max. thick.	width	length	
1"	4"	6, 12, 24"	36"	
1"	4"	24"	48"	

(1) Thicknesses from 1" to 4" in 1/2" increments; thicknesses over 2" are laminated. For thicknesses of 2" or more, product can be double-layered with joints staggered, or solid thicknesses to 4" may be used. Available in all sizes from Wabash, Ind. plant.

The information presented in this literature represents typical average values obtained by ASTM or other standard methods. The values will vary due to normal manufacturing variations. The person using this product must determine its suitability for his particular application.

For further information on these products, including non-standard sizes, contact U.S.G. Acoustical and Mineral Fiber Products Division #331-2 Chicago, or sales ofices as follows: Alabama: Birmingham (205) 849-0274, Indiana: Wabash (219) 563-2111, Texas: Corsicana (214) 874-4781, Washington: Tacoma (206) 627-0379.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.



description and utility

GLOBETRAY Cable Tray Systems, available in three interchangeable types, are continuous mechanical support systems designed for installation of control, power and signal conductors and other electrical services. Trays are made in straight sections, with matching fittings to accommodate all changes of direction or quantity of cables. System components are corrosion-resistant, being made from either heavygauge steel with galvanized finish or durable aluminum alloy. Design conforms to NEMA Standards.

These cable trays will also support metal, glass and plastic pipes used in chemical processing, hydraulic lines, and various other industrial equipment. Trays may be supported by GLOBE STRUT® Metal Framing (see U.S.G. Product Folder SA-1510 for suggested support system). Other features:

Maximum Cable Space—design allows full inside width and depth of tray to be utilized for cable.

Electrical Continuity—standard splice plate connections offer less than .00033 ohm resistance—assure electrical continuity between all sections in system.

Structural Continuity—these high-strength, engineered assemblies provide firm resistance to seismic forces and cable loads. Load-carrying capacities of all components—trays, fittings and accessories—are design-matched for complete system integrity. Easy Inspection—design of trays, except solid-bottom type, exposes installed cable for inspection from top and bottom.

Maximum Cable Protection—smooth buttonhead bolts and turned-out side rail flanges eliminate potential damage sources—assure maximum protection for installed cable. Inside of tray has no sharp edges, burrs or projections to damage cable insulation.

types and functions

GLOBETRAY Ladder Cable Tray

Straight sections and fittings consist of stiffened-channel rungs located between channel-shaped side rails having outward projecting flanges. Straight-section side rails have a top flange at least ¹³/₁₆" wide and a min. ³/₆" vertical stiffening lip. Side rail flanges of fittings are at least ¹³/₁₆" wide. Rungs are positioned with web up to provide a cable-support surface at least ⁷/₆" wide excluding corner radii. Rungs are MIG-welded to side rails and welds are cleaned. Available in light, medium and heavy-duty models (data below).

Ladder trays provide maximum ventilation to power cables and other heat-producing cables; however, cables are vulnerable to damage from external sources. The wider space between rungs meets minimum support requirements with maximum economy where cable load will not crush insulation and cable sag will be acceptable.

GLOBETRAY Solid Bottom Cable Tray

Straight sections and fittings feature a completely closed bottom. Straight sections are one-piece construction. Side rails have 1/6"-wide top flanges projecting horizonally inward. Tray sections are joined using H-bars to eliminate sharp edges.

Solid bottom trays provide cables with excellent shielding, support and protection from external damage. Used primarily for instrumentation, control, communication and other non-heat producing cables. They also meet requirements for trays that must pass through fire-resistant construction.

GLOBETRAY Trough Cable Tray

Straight sections are one-piece construction with integral cross rungs 1" o.c. Rungs have a semi-circular cross-section, ½" wide. Side rails have ½"-wide top flanges projecting horizontally inward. Solid bottom tray fittings, used in this system, have ends beaded to provide a smooth interior.

Trough trays, with their narrow openings in the tray bottom, provide cables with good protection from external damage, superior support and ample ventilation. Solid bottom fitting generally create no ventilation problems since they are a small part of the system; cables are adequately ventilated through straight sections.

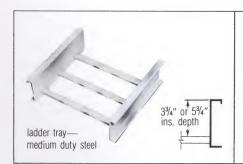
GLOBETRAY Channel Cable Tray

Straight sections are one-piece construction, 4½" wide with unflanged 1¼" deep side rails. Tray sections and fittings have closed bottom for use with lightweight cables and light duty applications.

product data-straight sections

tray type	nom. inside depth—in.	inside width—in.	standard iength—ft.	rung spacing—in.
ladder				
light duty steel	3, 4	6, 9, 12, 18, 24	12	6, 9, 12
light duty alum., medium duty steel and alum.	4, 6	6, 9, 12, 18, 24, 30, 36	12	6, 9, 12, 18
heavy duty steel and alum.	4, 6	6, 9, 12, 18, 24, 30, 36	12, 24	6, 9, 12, 18
trough				
steel and alum.	3, 4, 6*	4*, 6, 9, 12 18, 24, 30,*	12	1
solid bottom				
steel and alum.	3, 4, 6*	6*, 9, 12, 18, 24, 30, 36*	12	_
channel				
steel and alum.	11/4	41/2	12	_

^{*}These width and depth combinations are not available.







materials and finishes

Steel—steel used is of commercial quality, with a standard pregalvanized finish conforming to ASTM A525. Also available hot-dip galvinized after fabrication per ASTM A386 or with polyvinyl chloride (PVC) coating.

Aluminum—aluminum alloys used are selected for appropriate structural and physical properties. Trays are usually supplied with a natural finish, but PVC coating can be applied for additional protection.

fittings and accessories

Fittings and accessories in steel and aluminum are available, as outlined below, to complete the cable tray system installation. Consult current GLOBETRAY Cable Tray catalog G-661 for available product sizes and details.

Fittings—elbows, risers tees, crosses and reducers are used to join other tray sections and change size or direction of the system. Solid bottom fittings are standardized to serve both trough and solid bottom installations and provide economy.

Splice Plates—flat, 90° adjustable, expansion, extra-strength, grounding straps, reducer plates.

Covers—solid and louvered, flanged or non-flanged, are available for all straight sections. Solid covers, flanged and non-flanged, for all fittings. Cover clamps, extenders and clips to secure covers to tray sections and fittings.

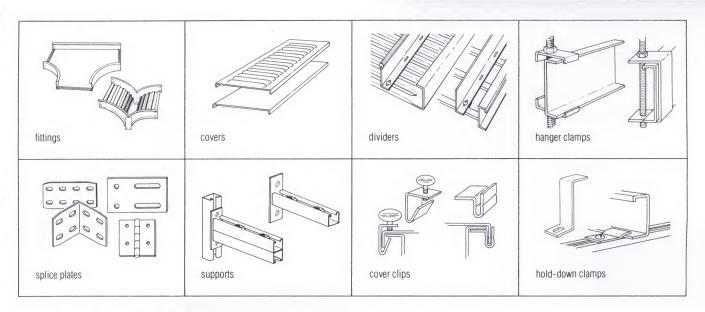
Supports—cable hanger elbows, cable tray support brackets and channels, tray hanger clamps, hold-down clamps. For other support material—channel framing, beam clamps, threaded rod or concrete inserts—see GLOBE STRUT Metal Framing catalog G-643.

Miscellaneous Accessories—blind ends, connectors, divider strips for straight sections and fittings, drop-out plates and bushings, cable and conduit clamps, rollers and pulleys for cable installation are available as normal acessories.

safe uniform load

The tables opposite show safe uniform load and deflection for 12" wide trays. Consult current GLOBETRAY Cable Tray catalog G-661 for data on other sizes.

GLOBETRAY Cable Trays SA-1610



load-deflection data—12-in. wide tray(1)

tray type & material	6' clear	span			8' clear span				10' clear span				12' clea	lear span			
material		deflection—in.				deflecti	on—in.		deflection—in.		on—in.			deflection—in.			
	load— lb./ft.	3" depth	4" depth	6" depth	ioad— lb./ft.	3" depth	4" depth	6" depth	load— lb./ft.	3" depth	4" depth	6" depth	load— lb./ft.	3" depth	4" depth	6" depth	
solid bottom steel aluminum	296 252	.13	.12 .11	.04	249 213	.27 .26	.31 .29	.11 .11	160 137	.44 .42	.45 .44	.17 .17	111 96	.63 .61	.67 .65	.24 .25	
trough steel aluminum	261 232	.43 .54	.36 .35	.25 .17	147 129	.75 .95	.64 .63	.47 .31	95 84	1.18 1.49	1.02	.72 .49	65 57	1.68 2.12	1.46 1.41	1.06	

load-deflection data—12-in. wide tray, 9-in. rung spacing(1)

tray type & material	6' clear s	span			8' clear span				10' clear	span	,		12' clea	12' clear span			
	load lb./ft.	defl.— in.	load— lb./ft.	defl.— In.	load— lb./ft.	defl.— in.	load lb./ft.	defl.— in.	load— lb./ft.	defl.— in.	load— lb./ft.	defl.— in.	load— lb./ft.	defl.— in.	load— lb./ft.	defl.—	
	3" depth		4" depth		3" depth		4" depth		3" depth		4" depth		3" depth	1	4" depti	1	
ladder—light du	ty																
steel	218	.272	277	.277	122	.488	156	.312	78	.753	100	.600	55	1.109	69	.828	
	load— lb./ft.	defl.—	load lb./ft.	defl.—	load— lb./ft.	defl.— in.	load— lb./ft.	defi									
	4" depth		6" depth		4" depth		6" depth		4" depth		6" depth		4" depth	1	6" depti	1	
ladder—light du	ty																
aluminum	285	.370	295	.160	160	.657	166	.286	103	1.027	106	.477	71	1.479	74	.644	
ladder-medium steel	duty 484	.288	547	.114	272	.513	307	.201	174	.802	197	.315	121	1.155	137	.454	

load-deflection data—12-in. wide tray. 9-in. rung spacing (1)

tray type & material	12' clea	rspan			14' clear span				16' clear span				20' clea	20' clear span			
material	4" depth	4" depth		6" depth		4" depth		6" depth 4" de		4" depth 6" depth		4" depti		h 6" depth		1	
	load— lb./ft.	defl.— in.	load— lb./ft.	defl.— in.	load— lb./ft.	defl.— in.	load— lb./ft.	defl.— in.	load lb./ft.	defl.— in.	load— lb./ft.	defl.— in.	load— lb./ft.	defl.— in.	load— lb./ft.	defl.— in.	
ladder-mediu	m duty																
aluminum	118	1.278	162	.658	86	1.726	119	.895	66	2.256	91	1.168	43	3.580	59	1.848	
ladder—heavy	duty																
steel	217	.967	276	.504	160	1.322	202	.683	122	1.719	155	.894	78	2.683	99	1.394	
aluminum	184	1.558	310	.879	136	2.120	228	1.196	104	2.770	175	1.563	66	4.327	112	2.443	

⁽¹⁾ Loads shown include 1.5 safety factor and are for cable tray supported on simple span and without splice connectors in the span. For data on other sizes and appropriate tray type, see U.S.G. catalog G-661.



specifications GENERAL PROVISIONS

work included

The electrical contractor shall furnish all labor, material and equipment to install the cable tray system and necessary support system as shown on the drawings and described in these specifications.

related standards

Unless otherwise specified herein, the cable tray system and support shall conform to current NEMA Standards Publication, No. VE-1.

submittals

Upon request, the contractor shall submit: (manufacturer's catalog illustrating all components and certified load-capacity data for the cable trays, splice connectors, supports and support anchorage) (drawings showing layout of system assembly) (detail drawings of all components and attachment to adjacent work and to each other) (straight-section tray samples).

handling and storage

Cable tray shall be handled with suitable slings to spread loading during lifting and not lifted by rungs. Cable tray materials shall be stored in a dry, well-ventilated location. In outside storage, materials shall be stacked on level mudsills, protected from the elements and properly ventilated to prevent condensation. Under humid conditions, cable tray sections shall have packing removed to prevent staining.

qualifications

All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its current printed directions.

BASIC MATERIALS AND METHODS

materials and finish

All cable tray straight sections, fittings, splice plates, divider strips, tray-to-box connectors and drop-outs shall be (steel, with hot-dip pregalvanized finish per ASTM A525) (steel, with hot-dip galvanized finish after fabrication) (aluminum alloy, natural finish). All nuts, bolts and washers shall be (steel, zinc electroplated), (stainless steel) (aluminum alloy 2024).

type and size

Cable tray system(s) shall be following type(s) and size(s):

- a. GLOBETRAY Ladder Tray—Straight sections and fittings with stiffened-channel rungs between channel-shaped side rails having inward or outward-projecting flanges. Straight-section side rails with a top flange at least \$13/16"\$ wide min. and \$%" stiffening lip. Fittings with side-rail flanges not less than \$13/16"\$ wide and having (12") (24") (36") min. radius. Straight sections and fittings providing (294") (394") (594") clear inside depth and clear inside widths as shown on drawings. Rungs positioned with web up to provide a flat, cable-support surface at least \$76"\$ wide excluding corner radii. Rung spacing (6") (9") (12") (18") on straight sections, 6" max. on fittings measured at center line of fitting. Rungs MIG-welded to side rails with welds cleaned. Inside of tray to present no sharp edges, burrs or projections to damage cable insulation.
- b. GLOBETRAY Solid Bottom Tray—Straight sections of one-piece construction with the bottom completely closed on straight sections and fittings. Side rails with ½"-wide top flanges projecting horizontally inward. Straight sections and fittings providing (3½") (4½") (6½") clear inside depth and clear inside widths as shown on drawings. Fittings with (12") (24") (36") min. radius. Tray sections joined with H-bars to eliminate sharp edges. Inside of tray to present no sharp edges, burrs or projections to damage cable insulation.
- c. GLOBETRAY Trough Tray—Straight sections of one-piece construction with integral semicircular cross rungs, ½" wide, and spaced 1" o.c.

Side rails with $\frac{7}{6}$ "-wide top flanges projecting horizontally inwards. Straight sections and fittings providing $(3\frac{1}{2})''$ $(4\frac{1}{2})''$ ($6\frac{1}{2}$ '') clear inside depth and clear inside widths as shown on drawings. Fittings of solid-bottom type with (12)'' (24)'' (36)'' min. radius and with ends beaded to provide a smooth interior. Inside of tray to present no sharp edges, burrs or projections to damage cable insulation.

d. GLOBETRAY Channel Tray—Tray sections of one-piece construction with bottom completely closed. Straight sections $4\frac{1}{2}$ " wide with unflanged $1\frac{1}{4}$ " deep side rails. Fittings with (12") (24") (36") min. radius. Tray sections joined with H-bars. Inside tray to present no sharp edges or projections to damage cable insulation.

load capacity

When tested in accordance with NEMA load test procedure, the cable tray system shall be capable of supporting a total cable load of () lb. per lin. ft. with safety factor of () for a () ft. simple span without a splice, and for a two-span condition with () ft. between supports with a splice at any location.

Straight sections and fittings shall not permanently deform under a ()-lb. static concentrated load applied vertically along a 4" length for both following conditions:

- a. Load applied to one side rail of tray section having specified cable load and support spacing. Load shall be applied at midpoint between supports over a splice connection.
- b. Load applied to one rung of empty tray section having specified support spacing. Load shall be applied at midpoint between side rails and supports.

supports

Supporting systems for cable tray shall be of type shown on the drawings. Load capacity and location of supports shall comply with NEMA Standards.

splice connectors

Splice connectors shall be used to join straight sections to each other and to fittings. Splices shall maintain specified loading and safety factor. Expansion-type splices shall be used wherever expansion joints occur in the base structure or where shown on the drawings.

electrical continuity

Connections between adjacent sections of the cable tray shall have 0.00033 ohm max. resistance as tested in accordance with NEMA Standards. All expansion and adjustable splices and fittings shall be equipped with a grounding strap.

covers and accessories

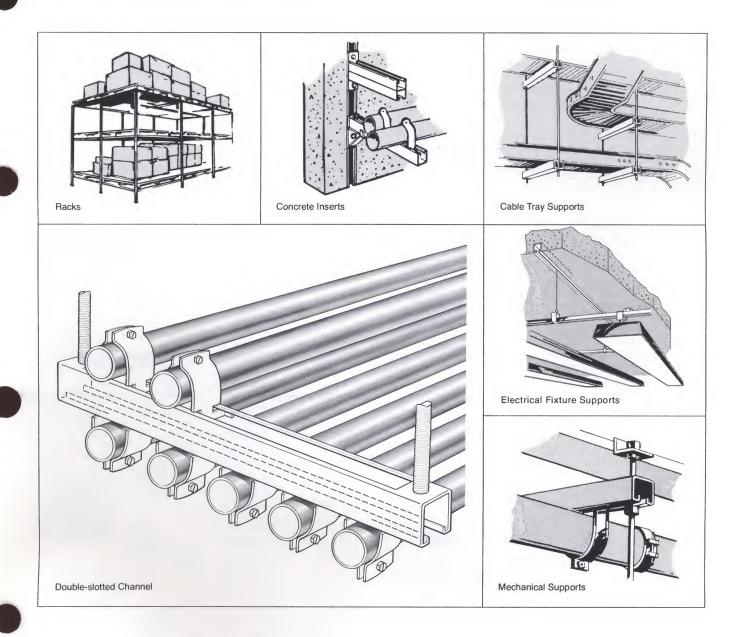
Covers for straight sections and fittings shall be (solid) (louvered) (flanged) (non-flanged). Cover attachment devices, tray divider strips, hold-down clamps, cable anchors and other accessories required for system installation shall be manufacturer's standard components.

GLOBETRAY Cable Tray Systems are available through distributors in principal cities. Consult our local representative for information, or write directly to: Metal Products Division, United States Gypsum Company, 101 So. Wacker Dr., Chicago, III. 60606.

Notice: WE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by improper application or use of these goods. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

Note: United States Gypsum reserves the right to make changes or improvements in the design of all catalogued items without notice and without obligation to incorporate these changes or improvements in items already manufactured.





description and utility

GLOBE STRUT Metal Framing satisfies a broad range of needs for a bolted framing system for mechanical, electrical and industrial applications. Designed and manufactured to exacting U.S.G. standards, it simplifies and reduces cost of structural fabrication and makes possible in-plant construction of structural frames for machinery, racks and pipes. Metal framing also offers a combination accessible surface raceway and support for lighting fixtures and electrical equipment.

When embedded in monolithic concrete, this economical framing provides a convenient flush mounting in walls, ceilings and floors. Roll-formed steel channels and hundreds of fittings, brackets, braces and accessories are available to provide these features:

Fast Installation—this system of metal framing is so simple, a hacksaw and wrench are the only tools required. What takes hours with welded framing often assembles in minutes with GLOBE STRUT Metal Framing. Positive Connections—the key element in the system is the electrogalvanized "triple grip" GLOBE STRUT Lock Nut. Its unique curved ends permit positioning inside the channel without tools. Triple-grip holding power comes from the built-on spring that holds the nut firmly against the inside of the channel lips, grooves that embrace the lips to prevent turning, serrations within the grooves that prevent slippage. Versatile—the number and combination of installations possible with this system are almost limitless. Best of all, when GLOBE STRUT Metal

this system are almost limitless. Best of all, when GLOBE STRUT Metal Framing has served its purpose in one capacity, it can be easily dismantled and reassembled for another use.

Permanent Finish—the galvanized finish literally becomes part of the metal—resists separation when crimped or subjected to impacts, stresses or pressures. GLOBE STRUT Metal Framing serves indoors or out, year after year. (Other finishes available.)

UNITED STATES GYPSUM

types and functions

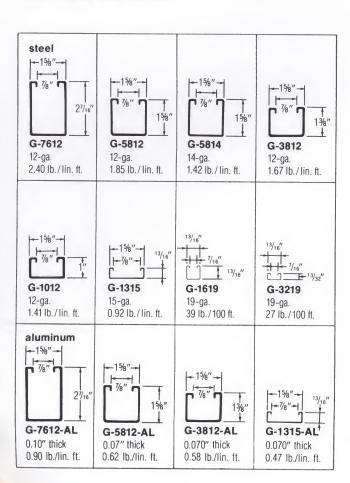
GLOBE STRUT Channels are available in either the basic solid continuous type or in six variations—combination, slotted, slotted-hole, double-slotted, knockout, punchout and concrete inserts—to meet specific uses. A specially designed lock nut and cap screw is used with appropriate fittings to assemble channels in any position or in any combination with other channel types.

Channel Framing

Basic Channels with a solid continuous web are used for general framing requirements. They are available in eight different sizes (see details below), cold-formed from mild steel to meet light, medium and heavy load requirements. Standard lengths: 10 and 20 ft. (except G-3219, 10 ft. only). Also available in G-7612-AL, G-5812-AL, G-3812-AL, G-1315-AL, extruded from aluminum alloy 6063-T6, 20-ft. length only. Finishes available: hot-dip mill galvanized meeting ASTM A525; hot-dip galvanized after fabrication meeting ASTM A153; painted with green lacquer after a thorough cleaning; plain, with no coating except preservative oil.

Combination Channels consist of two or more basic channels spotwelded back-to-back or side-to-side at the factory for use when extra load-carrying capacity is required. They are also used to provide additional slot openings simply and efficiently. To specify type of











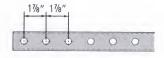
section required, add letter to channel designation, i.e., G-5812A, G-7612-C, etc.

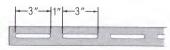
Punchout Channels have $9_{16}''$ dia. holes spaced 1%'' o.c. starting $13_{16}''$ from end. Prepunched holes offer added flexibility for attaching channels and fixtures. To specify, add suffix "PO" to product number. (G-7612, G-7612-AL, G-1619 and G-3219 excluded.) Lengths: 9'1134''; tolerance +%,", -0.

Slotted Channels have $^{13}/_{32}x3''$ slots spaced 4'' o.c. starting 1%'' from end. Ideal support for pipe, tube, conduit and cable tray. To specify, add suffix "SL" to product number. G-1619 and G-3219 excluded.) Standard lengths: 9'11%'' and 19'11%''; tol. +%'', -0.

Slotted-hole Channels have $^{9}/_{16}"$ dia. \times $^{7}/_{16}"$ slotted holes spaced 2" o.c. starting 1" from end. Slotted holes allow minor bolt adjustment, match spacing on many fittings. To specify, add suffix "SH" to product number. (G-7612, G-1619 and G-3219 excluded.) Length: $19'113'_4"$; tolerance $+\%''_8$, -0.

Double-slotted Channels have $\frac{1}{6}$ "x9" slots plus two $\frac{9}{16}$ " round holes per 12" length. Double slots permit positioning pipe, tube and conduit above and below support. To specify, add suffix "DS" to product number. (G-7612, G-1619 and G-3219 excluded.) Standard length: $\frac{10}{16}$ " and in 1-ft. increments up to 10 ft.; tolerance $\frac{1}{4}$ ", $\frac{-0}{16}$.



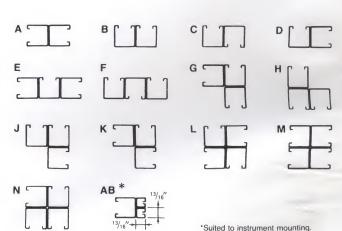


punch-out-web view

slotted channel-web view

available combinations of components

shape	Α	В	С	D	E	F	G	Н	J	K	L	M	N	AB
G-7612	×		×											х
G-5812	x	х	х	×	×	×	×	x	х	х	х	х	х	х
G-5814	х	х	x	х	×	×	×	х	х	х	Х	х	Х	х
G-3812	x	x	x					х				х		X
G-1012	x													х
G-1315	×													Х
G-1619	×													
G-3219	x													



GLOBE STRUT Metal Framing SA-1510

Fittings

Hundreds of fittings, brackets, clamps and fasteners are available to meet various framing needs. They serve multiple functions and eliminate the need for special parts. Fittings are designed for channels with are made of 1/4"x15/8" hot-rolled steel with 9/16" dia. holes, 13/16" from 90° angle fittings, screws and lock nuts are available for G-1619 and G-3219 channels with 13/16" wide slot. These fittings are made of o.c. Standard finish: electrogalvanized after fabrication. Basic fittings are described below; consult GLOBE STRUT Metal Framing catalog G-643 for specific details, sizes and lengths.

7/8" wide slot and interchangeable with many other brands. They ends and 17%" o.c., unless otherwise specified. Selected flat plate and 1/8"x13/16" hot-rolled steel with 9/32"dia. holes, 13/32" from ends and 11/16"

> Hardware-stud nut, coupling, universal lock nuts, standard bolts, screws, set screws, nuts, flat washers, lock washers.

Flat Plate Fittings—channel washers, splices, tees, angles, gussets, swivel plates.

90° Angle Fittings—standard, adjustable, webbed corner angles; bent tees; shelf gussets.

Bent-Strap Angle Connectors closed and open types, ad-

justable to full quadrant range. U-Shaped Fittings—standard and webbed front, one-side and two-side connectors.

Z-Shaped Fittings—channel supports, adjustable anchors, furring spacers.

Post Bases—short and tall. single- and double-column bases, center bolt bases.

Brackets-stair, shelf and channel brackets; braces; pipeaxle supports.

Beam Clamps—many types for channel attachment to beam flange, clamps for fixed or swivel hanger rods for 3,400-lb. loads.

Pipe Clamps—for thin-wall conduit, for heavy-wall conduit and pipe to 8" o.d.

Pipe Rollers-60° roller, axle type, adjustable.

Trolleys—single and double trolleys with needle bearings.

Cable Clamps—porcelain and maple cable clamps and saddles, maple bus bar clamps.

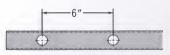


GICCE STRUT Surface Metal Raceway provides a versatile accessible interior distribution system, for electrical equipment and communication services. When used with lighting, it serves as an economical combination support and raceway for fluorescent fixtures.

Standard or Knockout Channels are used with Channel Closure Strips, fittings and accessories. GLOBE STRUT Channels (except G-7612, G-1619 and G-3219) are listed in Underwriters Laboratories Inc. Construction Materials List, Surface Metal Raceway (360 A19) Section. Labeled products available when required.

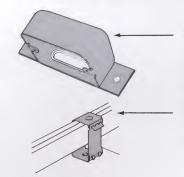
Knockout Channels have %" dia. knockouts 6" o.c. starting 3" from the end. To specify, add suffix "KO" to product number. (G-7612, G-1619 and G-3219 excluded.) Standard lengths $10'0'/_{16}$ " and 20'0%"; tolerance $+1/_4$ ", -0.

Channel Closure Strips convert channel for raceway applications: G-9090, cold-formed from 20-ga. galvanized steel; G-9090-AL extruded from 6063-T6 alloy aluminum, 0.05" thick. Std. length: 10'0".



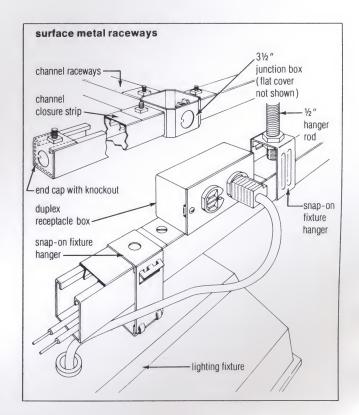
knockout channel-web view

channel closure strip

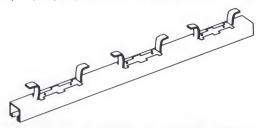


Raceway Fittings-end cap, plain or with knockouts; splice plate: aluminum nipple and lock nut; outlet box connector; receptacle box; 1-, 2-, 3-, 4-way junction boxes.

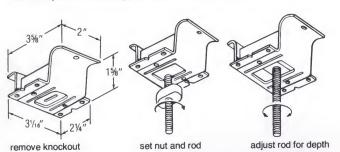
Fluorescent Fixture Fittingsfixture and channel hangers, fixture and hanger fasteners.



CI-5814 Series Concrete Inserts are made from G-5814 Channel; CI-5812 from G-5812; CI-3812 from G-3812; CI-1315 from G-1315; CI-1012 from G-1012 (see page 2, for basic sizes). Lengths: 20', 18', 16', 14', 12', 10', 8' 6'8", 6', 4', 40", 32" 24", 16", 12", and 8".



Concrete Spot Inserts, G-9221, also available where continuous inserts not required. Easily removed slotted knockout allows insertion of square or rectangular nuts for threaded rod.



Rectangular Nuts-Inserted into spot inserts on the end of a threaded rod. A simple twist after insertion turns nut crossways, securing it until rod end is turned against roof of insert.

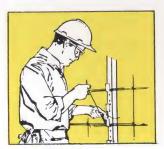
Square Nuts-Will not turn in concrete spot insert, permitting rod to be tightened without holding the nut.







nail insert to pouring face of form



wire-tie reinforcing to "ears"

specifications

channel framing

All channel framing shall be GLOBE STRUT, as manufactured by the Metal Products Division of United States Gypsum Company.

GLOBE STRUT Metal Framing straight sections shall be cold roll-formed from mild steel or extruded aluminum. The finish shall be (hot-dip mill-galvanized in accordance with ASTM Designation A525)(hot-dip galvanized after fabrication in accordance with ASTM Designation A153)(painted with green lacquer after a thorough cleaning and coating with phosphate solution to assure paint bond)(plain, without any coating except preservative oil).

The size of the straight sections shall be as follows:

designation	cross section	length	gauge
G-7612	2½6"x1%"	10'01/16" and 20'0%"	12
G-5812	1%″x1%″	10'01/16" and 20'01/8"	12
G-5814	1%"x1%"	10'01/16" and 20'01/8"	14
G-3812	1%"x1%"	10'01/16" and 20'0%"	12
G-1012	1"x1%"	10'01/16" and 20'0%"	12
G-1315	13/16"x15%"	10'01/16" and 20'03/6"	15
G-1619	¹³ / ₁₆ "X ¹³ / ₁₆ "	10'01/16" and 20'0%"	19
G-3219	¹³ / ₃₂ "X ¹³ / ₁₆ "	10′0½6″	19
G-7612-AL	2 ⁷ / ₁₆ "x1 ⁵ / ₈ "	20' only, extruded from 6063-T6	_
G-5812-AL	15/8"x15/8"	20' only, extruded from 6063-T6	_
G-3812-AL	13/8"x15/8"	20' only, extruded from 6063-T6	_
G-1315-AL	¹³ / ₁₆ "x1 ⁵ / ₈ "	20' only, extruded from 6063-T6	_

The tolerance on all lengths shall be + 1/4" -0.

Fittings shall be GLOBE STRUT fittings and shall be as described in the GLOBE STRUT Framing Catalog G-643 or the latest improvements in the line. The finish shall be (electrogalvanized) (hot-dip millgalvanized in accordance with ASTM Designation A525) (painted) (plain, without any coating except preservation oil).

Lock nuts shall be GLOBE STRUT lock nuts, manufactured of hot-rolled steel, cyanide-hardened and electroplated with zinc. They shall be furnished (with) (without) springs.

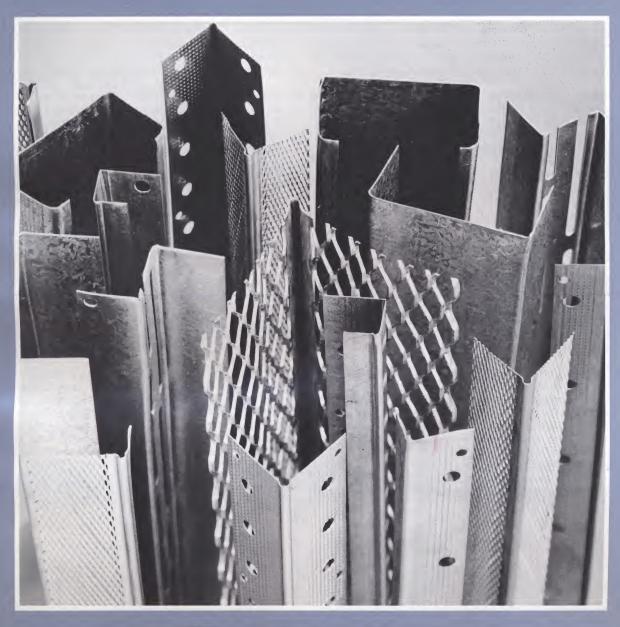
Bolts shall be GLOBE STRUT (Hex-Head Cap Screws) (Flat Head Machine Screws) (Round Head Machine Screws). The finish shall be electroplated zinc.

GLOBE STRUT Metal Framing is available through distributors in principal cities. Consult your U.S.G. Division representative for information, or write directly to: Metal Products Division, United States Gypsum Company, 101 So. Wacker Dr., Chicago, III. 60606.

NOTICE: WE SHALL NOT BE LIABLE FOR INCIDENTIAL AND CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY SUSTAINED, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

NOTE: United States Gypsum reserves the right to make changes or improvements in the design of all catalogued items without notice and without obligation to incorporate these changes or improvements in items already manufactured.

Steel Framing Components & Accessories for Drywall, Plaster & Load-bearing Construction



UNITED STATES GYPSUM

Steel Framing Components & Accessories

United States Gypsum offers the industry's broadest line of steel accessories and light framing components for rapid and dependable construction and finishing of drywall, veneer plaster and plaster partition/wall and ceiling assemblies, plus complete framing systems for special-function walls. U.S.G. accessories are *proven* and *preferred* in the market-place—engineered to work together. This catalog is organized for quick reference to the various components. Complete data is given on uses, installation, sizes, styles, packaging and weights of each item.

Drywall & Veneer Plaster components and accessories include: non-load bearing studs and runners for drywall partitions and curtain walls, attachments for facings, corner beads and control joints, also finishing trim and mouldings. These include various extruded plastic and metal trims to go around door and window openings. No. 093 Control Joint relieves transverse stresses caused by structural movement in large wall and ceiling areas. Also included is the RC-1 Resilient Channel, an economical and effective method of improving sound attenuation in woodframed partitions and ceilings. Included with them are drywall ceiling suspension components and data plus limiting height data on partition framing members.

Plaster partition components include: various types of metal lath, tie wire, many types of attachment clips for plaster and gypsum bases, plus open-web and channel studs and control joints, also several types of corner beads and plaster ceiling accessories for use with conventional plaster construction.

USG Metal Lath provides small mesh openings for mechanical keying of plaster—made in Diamond Mesh, Riblath and Stuccomesh types and in two different weights for each style. All are made from cold-rolled steel, with a coating of black asphaltum paint. Some are available with galvanized coating for added corrosion resistance.

USG Corner Beads protect and provide true, straight exterior corners, also serve as grounds for plastering. USG Casing Beads are used around wall openings and at inter-

sections of plaster with other finishes. A choice of steel and plastic trims is available to complete the job.

Control joints are important to relieve stresses of expansion and contraction, thus helping to prevent plaster cracking.

Load-bearing Framing components include load-bearing studs, runners, floor joists, plus a complete line of accessory end clips, joist hangers, C-closures and V-bracing.

Special Framing, Furring & Accessories include: various framing and accessory steel components constituting the USG Shaft Wall and USG Area Separation Wall Systems, plus a number of furring items for use in walls, partitions and ceilings. All offer the advantages of light weight, low material cost, quick erection, and the superior strength of steel. The two special-wall framing systems save in both cost and weight by combining steel and gypsum for these applications that are usually masonry construction. Also shown are two lines of attachment screws complete with specialized types for every drywall/plaster partition and ceiling application. All are available in a range of sizes for total versatility.

Steel runners provide secure anchorage, alignment and installation economies for partitions and wall-furring assemblies. They are designed for use with matching studs, furring and lathing channels and wall-furring brackets.

For full design data, application details and directions, see U.S.G. Technical Folders CS-1, -8, -15, -24 and -54. Assemblies using these components are also shown in current U.S.G. Architectural Technical Literature, which covers such construction products as gypsum panels, gypsum plasters, veneer plasters and plaster bases; sealants and joint treatment products; insulation of various types.

NOTICE: The following trademarks used herein are owned by United States Gypsum Company: SHEETROCK, DUR-A-BEAD, DURABOND, TRUSSTEEL, BRIDJOINT, BRACE-TITE, TRUS-LOK, ROCKLATH, IMPERIAL, TEXTONE, ULTRAWALL, DIAMOND, USG, THERMAFIBER, RC-1, SUPER-TITE. FOAMULAR is a trademark of UC Industries. TAPCON is a trademark of Illinois Tool Works, Inc.

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for drywall and plaster

USG Steel Studs and Runners are channel-type components, roll-formed from corrosion-resistant coated steel in three series of non-load bearing studs—Styles ST, STL, CWS—and companion runners—Styles CR, CRL, CWR. Together, components provide efficient low-cost framing for partitions, ceilings and column fireproofing and exterior curtain wall systems, in multi-family residential and light commercial buildings. All studs are designed for quick screw attachment of facing materials, and are supplied cut-to-length to eliminate scrap. Runners are designed to align and secure studs to floors and ceilings, also function as headers. Made with unhemmed 11/4" leg except where noted otherwise.

Designations codify size and style, in which nominal section depth (size), in inches, is indicated by first three digits—358 for 35%", 600 for 6"—and component name is abbreviated by the following two or three digits—ST, STL or CWS for stud, CR, CRL or CWR for "C" channel runner. Factory-painted ends color-code gauge of members for easy identification: pink for STL/CRL, white for CWS/CWR, none for ST/CR.

thickness-steel studs (1)

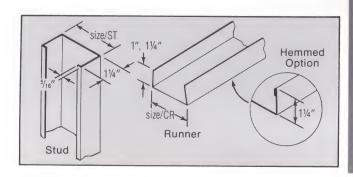
stud	desig	n (2)	mini			
style	in	mm	in	mm	gauge (3)	
ST STL CWS	0.0188 0.0168 0.0344	(0.48) (0.43) (0.87)	0.0179 0.0160 0.0329	(0.45) (0.41) (0.84)	25 26 20	

- Uncoated steel thickness meets ASTM A568. ST and CWS Studs meet ASTM C645. Coatings are hot-dip galvanized per ASTM A525; aluminized per ASTM A463, or 55% aluminum-zinc.
 Conforms to AISI Specification for the Design of Cold Formed Steel Structural Members, 1980
- edition.

 (3) For information only; refer to limiting height and structural properties table for design data.
- ST Studs and CR Runners—for interior partitions, drywall ceilings, and column fireproofing; for plaster systems, with IMPERIAL Gypsum Base or ROCKLATH Plaster Base rigidly attached to utilize membrane strength of the lath and plaster. Supplied with knockouts 12" from each end to accommodate conduit and pipe, also available with continuous keyhole cutouts in selected markets. Can be overlapped and spliced.

STL Studs and CRL Runners—identical to ST Studs and CR Runners in configuration, and for similar applications, but lighter. Provide greater economy where ST/CR strength isn't needed. May be substituted for ST/CR members in U.S.G. partition assemblies without affecting sound and fire ratings. Studs supplied with "keyhole" cutouts for passage of pipes or channels.

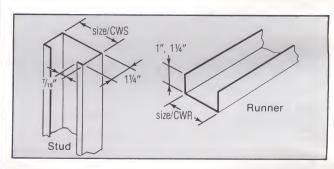
Limitation: STL Studs and CRL Runners meet all ASTM C645 requirements except minimum steel thickness.



		Si	ze				
Component	Sec	t. Depth	L	ength.	Pcs./	Appro	ox. Wt.
Designation	in	(mm)	ft	(mm)	Bundle	lb/1000 ft	(kg/100 m)
ST Studs							
158ST	15/8	(41.3)	(cut to		325	(48.3)
212ST	21/2	(63.5)	0	rder-		375	(55.8)
358ST	35/8	(92.1)	r	nax.;)	10	450	(66.9)
400ST	4	(101.6)			l	475	(70.6)
600ST	6	(152.4)	20	(6100)		610	(90.7)
STL Studs							
158STL	15/8	(41.3)	(cut to		283	(42.1)
212STL	21/2	(63.5)	o	rder-	10	332	(49.4)
358STL	35/8	(92.1)	l n	nax.;)		402	(59.8)

							Bur	idle C	lty.			
		Size					Wt.					
Component	Sect. Depth		Length		No./	1	1" Leg		11/4" Leg		Lgth.	
Designation	in	(mm)	in	(mm)	Pcs.	lb	(kg)	lb	(kg)	ft	(m)	
CR Runners						-						
158CR 212CR 358CR 400CR 600CR	1 5% 2 ½ 3 5% 4 6	(41.3) (63.5) (92.1) (101.6) (152.4)	10	(3050)	10	23 29 37 38 52	(10.4) (13.1) (16.7) (17.2) (23.5)	27 32 40 42	(13.2) (14.5) (18.1) (19.0)	100 100 100 100 100	(30.5 (30.5 (30.5 (30.5 (30.5	
CRL Runners					_							
158CRL 212CRL 358CRL 400CRL 600CRL	15/8 21/2 35/8 4 6	(41.3) (63.5) (92.1) (101.6) (152.4)	10	(3050)	10	22 28 35 37 50	(10.0) (12.7) (15.9) (16.8) (22.7)	25 31 38 40	(11.3) (14.1) (17.2) (18.1)	100 100 100 100 100	(30.5) (30.5) (30.5) (30.5) (30.5)	

CWS Studs and CWR Runners—for non-load bearing USG Curtain Wall Systems or interior assemblies of greater-than-normal height, and as special reinforcement for door frames. CWS/CWR Studs/Runners meet ASTM A568 for uncoated steel thickness, and are supplied with a corrosion-resistant coating of: G60 hot-dip galvanizing, meeting ASTM A525; aluminizing, meeting ASTM A463; or 55% aluminum-zinc.



		Size						
Component	Sect	. Depth	Le	Length		Approx. Wt.		
Designation	in	(mm)	ft	(mm)	Pcs./ Bundle	lb/1000 ff	(kg/100 m)	
CWS Studs								
212CWS 358CWS 400CWS	2½ 35/8 4	(63.5) (92.1) (101.6)	(cut to order- max.)		to order	725 850 900	(107.9) (126.5) (133.9)	
600CWS	6	(152.4)	28	(8530)		1170	(174.1)	
CWR Runners								
212CWR 358CWR 400CWR 600CWR	2½ 35/8 4	(63.5) (92.1) (101.6) (152.4)	10	(3050)	to order	630 775 820 1075	(93.7) (115.3) (122.0) (160.0)	

USG Steel Studs (SJ, CS) for load-bearing walls and non-load bearing (curtain) walls in residential and light commercial applications. SJ studs are nestable with virtually no change in outside dimension for double use, or in combinations of three or four. 11/2"x 4" slotted holes are punched 24" o.c. in web for electrical and piping, and also to provide access for bracing. Welded attachment op-

USG Steel Studs and Runners carry a three-part code that identifies the size (35-31/2", 362-35/8", etc.), style code (SJ-stud joist, CR-C-runner, CS-channel stud, WS-web stiffener) and steel thickness based on gauge (see table below). Items are end-color coded at the factory to indicate gauge and help identify products on the job.

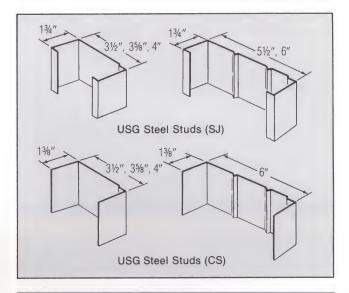
		Size					
Component	Nom.	Sect. Depth	L	ength	Pcs./	Approx	. Wt. (1)
Designation	in	(mm)	ft	(mm)	Bundle	lb/1000 ft	(kg/100 m)
SJ Stud/Joi	ists						
35SJ22 35SJ20 35SJ18 35SJ16 35SJ14	31/2	(88.9)	to	order	to order	800 950 1220 1560 1960	(119) (141) (182) (232) (292)
362SJ22 362SJ20 362SJ18 362SJ16 362SJ14	3%	(92.1)	to	order	to order	820 970 1240 1590 2000	(122) (144) (185) (237) (298)
40SJ20 40SJ18 40SJ16 40SJ14	4	(101.6)	to	order	to order	1020 1300 1670 2090	(152) (193) (248) (311)
55SJ20 55SJ18 55SJ16 55SJ14	51/2	(139.7)	to	order	to order	1210 1550 1980 2490	(180) (231) (295) (371)
60SJ20 60SJ18 60SJ16 60SJ14	6	(152.4)	to	order	to order	1270 1630 2080 2620	(189) (243) (310) (390)
CR Runner	s						
35CR22 35CR20 35CR18 35CR16 35CR14	3½	(88.9)	10	(3050)	to order	590 700 910 1130 1430	(88) (104) (135) (168) (212)
362CR22 362CR20 362CR18 362CR16 362CR14	35%	(92.1)	10	(3050)	to order	600 720 930 1160 1470	(89) (107) (138) (173) (219)
40CR20 40CR18 40CR16 40CR14	4	(101.6)	10	(3050)	to order	770 990 1240 1570	(114) (147) (185) (234)
55CR20 55CR18 55CR16 55CR14	5½	(139.7)	10	(3050)	to order	960 1250 1550 1960	(143) (186) (231) (292)
60CR18 60CR16 60CR14	6	(152.4)	10	(3050)	to order	1330 1650 2090	(198) (246) (311)
CS Studs							
35CS18 35CS16 35CS14	31/2	(88.9)	to	order	to order	980 1220 1540	(146) (182) (229)
362CS18 362CS16 362CS14	3%	(92.1)	to	order	to order	1010 1250 1580	(150) (186) (235)
40CS18 40CS16 40CS14	4	(101.6)	to	order	to order	1070 1330 1670	(159) (198) (248)
60CS18 60CS16 60CS14	6	(152.4)	to	order	to order	1400 1740 2200	(208) (259) (327)

⁽¹⁾ Corrosion-resistant coating included for all components. Steel yield strength 40 ksi for studs, 33 ksi for runners

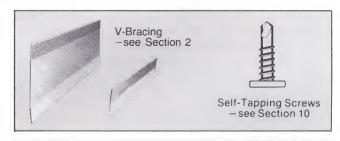
thickness-steel components (1)

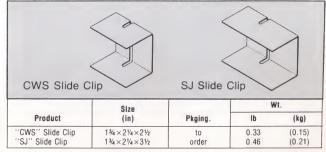
Components	Desig	n (2)	Mini	mum		Gauge Code
Designation	in	(mm)	in	(mm)	Gauge (3)	(end color)
SJ, CR22 SJ, CR20 SJ, CS, CR18	0.0299 0.0359 0.0478	(0.76) (0.91) (1.21)	0.0284 0.0341 0.0454 0.0568	(0.72) (0.87) (1.15) (1.44)	22 20 18 16	blue white yellow
SJ, CS, CR16 SJ, CS, CR14	0.0598 0.0747	(1.52) (1.90)	0.0368	(1.44)	14	green orange

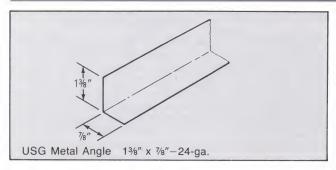
- (1) Uncoated steel thickness, meets ASTM A568. Studs meet ASTM C645. Coatings are hot-dip galvanized (G-60) per ASTM A525; aluminized per ASTM A463, or 55% aluminum zinc.
 (2) Conforms to AISI Specification for the Design of Cold Formed Steel Structural Members, 1980
- (3) For information only; refer to limiting height and structural properties table for design data.



Steel Stud Accessories include: V-bracing; self-drilling, self-tapping screws and curtain wall slide clips. V-bracing comes in 11/2" and 4" wide, 20-ga. galvanized steel for lateral bracing (11/2"), and diagonal bracing to resist racking under wind or seismic loads (4"). Screws permit rapid attachment of facings and sheathing. Curtain Wall Slide Clips are 134×214" channel sections of 14-ga. galvanized steel which attach curtain wall studs to horizontal supports, yet slide to allow vertical building movement without transferring loads into curtain wall.



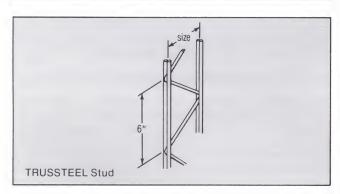




for drywall and plaster

USG Metal Angle is of 24-ga. galvanized steel, used to secure 1" coreboard at floor and ceiling with laminated drywall gypsum partitions or with single and double solid IMPERIAL Plaster Partitions. Other sizes/gauges available upon request.

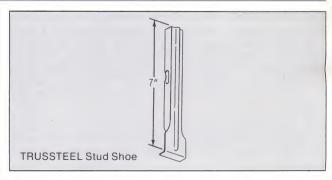
Product		Size					Bundle Qty.				
	S	Sect.		Lgth.		Wt.		Lgth.			
	in	(mm)	ft	(mm)	No. Pcs.	lb	(kg)	ft	(m)		
USG Metal Angle	13/8 x 7/8	(34.9 x 22.2)	10	(3050)	10	22	(9.8)	100	(30.5)		



for plaster

TRUSSTEEL Studs are used for erection of hollow, fire-resistant plastered partitions and curtain walls. They are formed from cold-drawn No. 7-ga. steel wire with a tensile strength of 90,000 psi. A continuous diagonal wire web is welded to double-wire flanges to provide an openweb design that readily accommodates pipes, conduits and ducts without impairing the strength of the partition assembly. Supplied painted. Used in construction of framing for the direct or resilient attachment of USG Metal Lath or ROCKLATH Plaster Base.

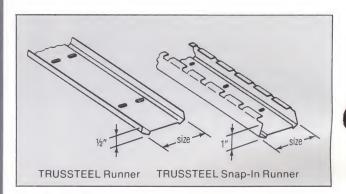
	Sect. Depth			Shipping	Approx. Wt.		
Product	in	(mm)	Length	Unit	Ib/1000 ft	(kg/100 m)	
TRUSSTEEL Stud	15/8 21/2 31/4 4 6	(41.3) (63.5) (82.6) (101.6) (152.4)	to order	10 pcs.	440 455 470 485 515	(65.5) (67.7) (69.9) (72.2) (76.6)	



for plaster

TRUSSTEEL Stud Shoes, 7" long, are used for connecting studs to TRUSSTEEL Runners, permit adjustment up to 4" in partition height. Available 24-ga. galvanized steel.

		Carton Qty.	
		٧	Veight
Product	No. Pcs.	lb	(kg)
TRUSSTEEL Stud Shoe	500	40	(18.1)



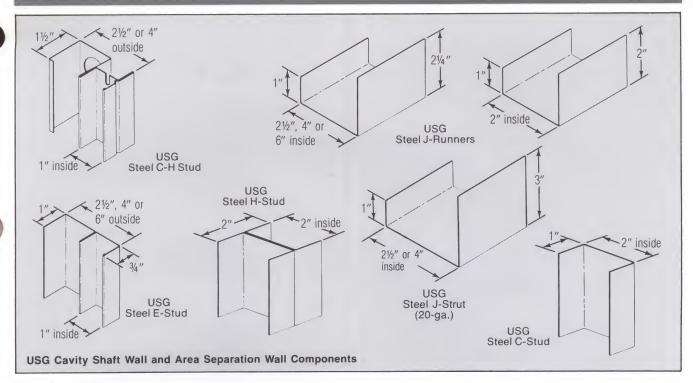
for plaster

TRUSSTEEL Runners are used with TRUSSTEEL Stud Shoes to anchor partition to floor or ceiling, particularly where there is considerable floor-to-ceiling height variation. Available galvanized for all widths of TRUSSTEEL Studs. Where top runner is attached to suspended or furred framing, 1" tapping screws are used to anchor top course of lath into web wires of studs.

							Bundle 0	lty.	
	Size		Length		No.	Wt.		Lgth.	
Product	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)
	15/8	(41.3)	10	(3050)	10	20	(9.1)	100	(30.5
TRUSSTEEL	21/2	(63.5)	10	(3050)	10	27	(12.0)	100	(30.5
Runner	31/4	(82.6)	10	(3050)	10	33	(14.7)	100	(30.5
nullilet	4	(101.6)	10	(3050)	10	38	(17.0)	100	(30.5
	6	(152.4)	10	(3050)	10	53	(23.8)	100	(30.5

TRUSSTEEL Snap-in Runners are used in anchoring TRUSSTEEL Stud partitions to the floor. Attachment of stud to runner is by a snap-in feature, eliminating the need for stud shoes. When it is used as a ceiling runner in a fire-rated construction, TRUSSTEEL Stud Shoes are required.

					Bundle Qty.					
Product	Size		Length		No.	Wt.		Lgth.		
	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
	15/8	(41.3)	10	(3050)	10	30	(13.4)	100	(30.5)	
TRUSSTEEL	21/2	(63.5)	10	(3050)	10	36	(16.1)	100	(30.5)	
Snap-In Runner	31/4	(82.6)	10	(3050)	10	42	(18.8)	100	(30.5)	
	4	(101.6)	10	(3050)	10	47	(21.3)	100	(30.5)	



for drywall

USG Cavity Shaft Wall / Area Separation Wall components are versatile, lightweight, non-load bearing members for use in USG Shaft Wall and Area Separation Wall systems. These include: C-H and E-Studs for cavity walls, H- and C-Studs for solid walls, J-Runners for both, and the J-Strut for framing at door openings for specific fire tests. All are end-color coded for easy gauge identification.

thickness-steel component (1)

Components	Desig	n (2)	Mini	mum		Gauge Code
Designation	In	(mm)	in	(mm)	Gauge (3)	(end color)
CH, ES 25	0.0209	(0.53)	0.0199	(0.51)	25	black
JR, HS 24	0.0237	(0.60)	0.0225	(0.57)	24	red
CH 22	0.0310	(0.79)	0.0294	(0.75)	22	blue
ES, JR, JS 20	0.0359	(0.91)	0.0341	(0.87)	20	white
CH, HS 20	0.0359	(0.91)	0.0341	(0.87)	20	white

(1) Uncoated steel thickness, meets ASTM A568. Studs meet ASTM C645. Base metal meets ASTM A446 standards for structural performance. Min. yield strength 33 ksi, except C-H stud 40 ksi. Coatings are hot-dip galvanized per ASTM A525; aluminized per ASTM A463, or 55% aluminum-zinc.

(2) Conforms to AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition

(3) For information only; refer to limiting tables and structural properties for design data.

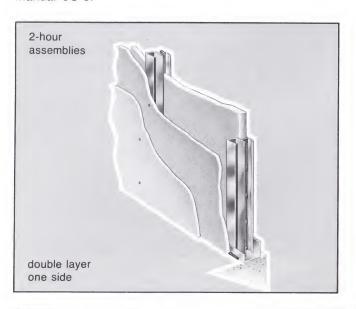
C-H Studs are produced from Lock Forming Quality steel meeting ASTM A527, or 40,000 psi. minimum yield strength and supplied with a corrosion-resistant coating of G60 hot-dip galvanizing meeting ASTM A525, or aluminizing meeting ASTM A463, or 55% aluminum-zinc. All other components are produced from steel meeting ASTM A526, and supplied with a corrosion-resistant coating of: G60 hot-dip galvanizing meeting ASTM A525, aluminizing meeting ASTM A463, or 55% aluminum zinc.

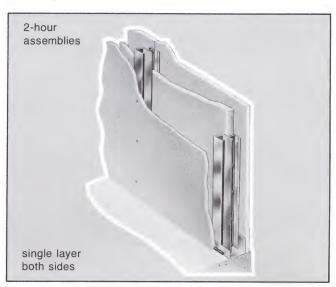
Component	Sect	on Depth		Length	Approx	. Weight
Designation (1)	in	(mm)	ft	(mm)	lb/1000 ft	(kg/100 m)
C-H Studs 212CH25 212CH22 400CH25 400CH20	2½ 2½ 4 4	(63.5) (63.5) (101.6) (101.6)	8 to 16 8 to 18 8 to 16 8 to 25	(2440 to 4880) (2440 to 5490) (2440 to 4880) (2440 to 7620)	595 850 705 1245	(88.5) (126.5) (104.9) (185.3)
E-Studs 212ES25 400ES20 600ES25	2½ 4 6	(63.5) (101.6) (152.4)	8 to 28 8 to 28 8 to 28	(2440 to 8530) (2440 to 8530) (2440 to 8530)	460 930 1545	(68.4) (138.4) (229.9)
J-Runners 200JR24 200JR20 212JR20 212JR20 400JR24 400JR20 600JR24 600JR20	2 2 2½ 2½ 4 4 6	(50.8) (50.8) (63.5) (63.5) (101.6) (101.6) (152.4) (152.4)	10 10 10 10 10 10 10	(3050) (3050) (3050) (3050) (3050) (3050) (3050) (3050)	460 673 535 736 680 937 860 1191	(68.4) (100.2) (79.6) (109.5) (101.2) (139.4) (128.0) (177.2)
H-Studs 200HS25 200HS24 200HS20	2 2 2	(50.8) (50.8) (50.8)	8 to 12 8 to 16 8 to 16	(2440 to 4880) (2440 to 4880) (2440 to 4880)	603 685 1010	(89.7) (101.9) (150.3)
C-Studs 200CS24 200CS20	2 2	(50.8) (50.8)	8 to 16 8 to 16	(2440 to 4880) (2440 to 4880)	345 505	(51.3) (75.1)
J-Strut 212JS20 400JS20	2½ 4	(63.5) (101.6)	8 to 12 8 to 12	(2440 to 3660) (2440 to 3660)	826 1026	(122.9) (152.7)

(1) All components shipped unbundled; additional charge for bundling

for drywall

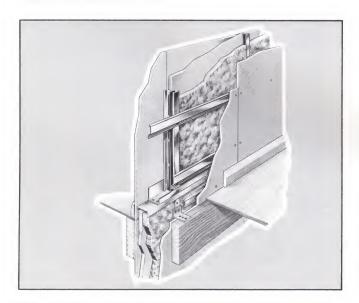
USG Cavity Shaft Wall is ideal for enclosing elevator shafts, stairwells or other vertical shafts in multi-story buildings. See page 7 for specific component information; for additional details, drawings and construction standards, see U.S.G. system folder SA-922 or Shaft Wall Manual CS-8.



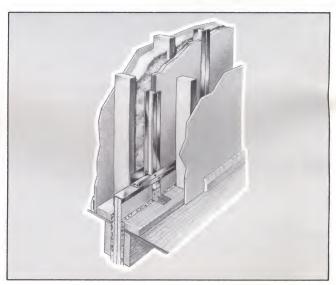


for drywall

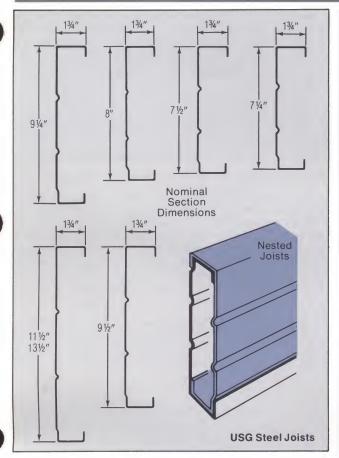
USG Area Separation Walls designed as vertical fire/sound barriers separating occupancies in wood-frame apartments and townhouses. Available in cavity or solid types. See page 7 for specific component information; for additional information and detail drawings, see U.S.G. folders SA-925 or CS-15.



Cavity type—interior floor/ceiling heights up to 11 ft. (5-psf lateral load), or as exterior walls up to 8 ft. (15-psf wind load with L/240 maximum deflection).



Solid type—interior floor/ceiling heights up to 10 ft. (5-psf lateral load), or as exterior walls up to 8 ft. (15-psf wind load with L/240 maximum deflection).



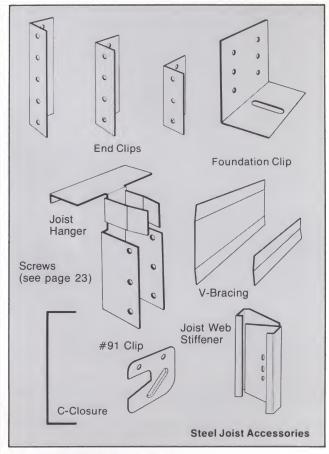
for drywall and plaster

USG Steel Joists are load-bearing channel-type framing members, of roll-formed steel meeting ASTM A568 for uncoated steel thickness, and supplied with a corrosion-resistant coating of: G60 hot-dip galvanizing, meeting ASTM A525; aluminizing, meeting ASTM A463; or 55% aluminum-zinc. Numerous styles available in cut-to-order lengths, to 30 ft. max. Configuration permits nesting, virtually without increase in dimension. Accessory stiffeners, when required prevent web crippling at points of reaction and concentrated load.

 $11\!\!/\!\!2"x$ 4" slotted holes punched 24" o.c. in webs simplify electrical, plumbing, and/or bracing using cold rolled channel. For limitations see folders SA-510 and CS-54.

Steel	Nom.	Sect. Depth	L	ength	Approx.	Weight (1)
Joists (1)	in	(mm)	ft	(mm)	lb/1000 ft	(kg/100 m)
725SJ18 725SJ16 725SJ14	71/4	(184.2)	up to 30	(up to 9150)	1,830 2,380 2,960	(272) (354) (440)
75SJ18 75SJ16 75SJ14	71/2	(190.5)	up to 30	(up to 9150)	1,880 2,450 3,040	(280) (365) (452)
80SJ18 80SJ16 80SJ14	8	(203.2)	up to 30	(up to 9150)	1,900 2,500 3,160	(283) (372) (470)
925SJ16 925SJ14	91/4	(235.0)	up to 30	(up to 9150)	2,820 3,500	(420) (521)
95SJ16 95SJ14	91/2	(241.3)	up to 30	(up to 9150)	2,870 3,560	(427) (530)
115SJ16 115SJ14	111/2	(285.8)	up to 30	(up to 9150)	3,230 4,100	(481) (610)
135SJ14	131/2	(342.9)	up to 30	(up to 9150)	4,630	(689)

(1) Coating included in weight for all components. Steel yield strength: 40 ksi.



for drywall and plaster

Steel Joist Accessories include a complete line of clips, joist web stiffeners, brackets, closures and screws. End clips are 14-ga. galvanized steel, foundation clips and joist hangers 16-ga. (for anchoring header joists and suspending joists from header joists, respectively). #91 clips anchor joists to steel beams. 18-ga. C-closures cap the ends of joists and provide restraint against rotation. V-bracing is 20-ga., and supplied in 1½- and 4-in. widths for bridging (where required).

C-closures (1)-product data

		Size (depth)			VQ.	Sec	tion
Company	Nominal		Actual		Net Wt. (2)		Area (3)	
Component Designation	in	(mm)	in	(mm)	lb/ft	(kg/m)	in ²	(mm²)
725CR18	71/4	(180)	7.355	(186.8)	1.61	(2.39)	0.463	(290)
75CR18	71/2	(190)	7.605	(193.2)	1.66	(2.47)	0.475	(297)
80CR18	8	(203)	8.105	(205.9)	1.74	(2.59)	0.499	(312)
925CR18	91/4	(235)	9.355	(237.6)	1.94	(2.89)	0.558	(349)
95CR18	91/2	(240)	9.605	(244.0)	1.99	(2.96)	0.570	(356)
115CR18	111/2	(290)	11.605	(294.8)	2.32	(3.45)	0.665	(416)

(1) Steel yield strength 33 ksi.

(2) Steel with corrosion-resistant coating. (3) Steel without coating.

thickness-steel components (1)

Components	Desig	n (2)	Mini	mum		Gauge Code	
Designation	in	in (mm)		(mm)	Gauge (3)	(end color)	
SJ, CR 22	0.0299	(0.76)	0.0284	(0.72)	22	blue	
SJ, CR20	0.0359	(0.91)	0.0341	(0.87)	20	white	
SJ, CS, CR18	0.0478	(1.21)	0.0454	(1.15)	18	yellow	
SJ, CS, CR16	0.0598	(1.52)	0.0568	(1.44)	16	green	
SJ, CS, CR14	0.0747	(1.90)	0.0710	(1.80)	14	orange	

Uncoated steel thickness; meets ASTM A568. Studs meet ASTM C645. Coatings are hot-dip galvanized (G-60) per ASTM A525; aluminized per ASTM A463, or 55% aluminum zinc.
 Conforms to AISI Specification for the Design of Cold Formed Steel Structural Members, 1980

(2) Conforms to AISI Specification for the Design of Cold Formed Steel Structural Members, 1980 edition.
 (3) For information only; refer to limiting height and structural properties table for design data.





USG Junior Diamond Mesh Lath is a small-mesh metal plaster base (approx. 11,000 meshes per yd²). A general all-purpose lath, best for ornamental and contour plastering. Small meshes conserve plaster and reduce droppings. Available painted or galvanized.

Size: 27"x96" (686x2440 mm); weights: 2.5 lb/yd²-end painted white; 3.4 lb/yd²-end painted red.

USG Self-Furring Diamond Mesh Lath is also available in painted or galvanized self-furring having 1/4" "dimple" indentations spaced 1½" o.c. each way for use as exterior stucco base, column fireproofing and for replastering over old surfaces. Size: 27"x 96" (686x2440mm); weights: 2.5 lb/yd²-end painted white; 3.4 lb/yd²-end painted red.

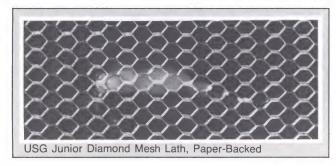
Regular

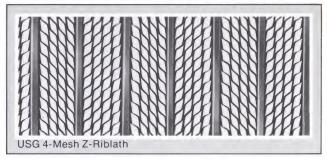
Approx.	Lath Wt.	Fir	nish	No.		Wt.	1	Area
lb/yd²	(kg/m²)	Ptd.	Galv.	Pcs.	lb	(kg)	yd²	(m ²)
2.5	(1.4)	х	х	10	50	(22.7)	20	(16.7)
3.4	(1.8)	х	х	10	68	(30.8)	20	(16.7)

Self-Furring (1)

Approx.	Lath Wt.	Fir	nish	No.		Wt.	1	Area
lb/yd²	(kg/m²)	Ptd.	Galv.	Pcs.	lb	(kg)	yd²	(m ²)
2.5	(1.4)	х	x	10	50	(22.7)	20	(16.7
3.4	(1.8)	х	х	10	68	(30.8)	20	(16.7

(1) Also available in Paper-Backed

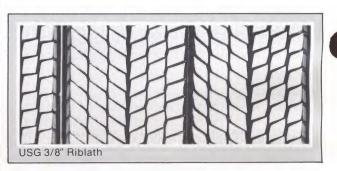




for plaster

USG 4-Mesh Z-Riblath is a "flat-rib" type lath with smaller mesh openings, suitable for "double-up" plastering. An excellent nail-on lath or for tie-on work on flat ceilings. Size: 27"x96" (686x2440 mm); weights: 2.75 lb/yd²-end painted white; 3.4/lb/yd²-end painted red. *Limitations*: not recommended for contour plastering; Diamond Mesh preferred.

Approx. Lath Wt.		Fir	Finish		No. Wt.		-	Area
lb/yd²	(kg/m²)	Ptd.	Galv.	Pcs.	lb	(kg)	yd²	(m ²)
2.75	(1.5)	х	_	10	55	(24.9)	20	(16.7)
3.4	(1.8)	X	Х	10	68	(30.8)	20	(16.7)



for plaster

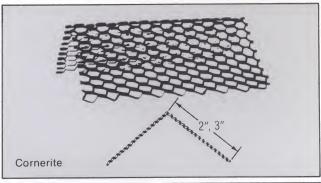
USG 3/8" Riblath has a herringbone mesh pattern with 3/8" V-shaped ribs running length of sheet at 4½" intervals, with intermediate 3/16" ribs. The heavy ribs provide exceptional rigidity. Used when supports are spaced more than 16" o.c.—and not more than 24" o.c.—and for 2" solid studless metal-lath-and-plaster partitions. Size: 27"x96" (686x2440 mm), other lengths available; weight: 3.4 lb/yd²—end painted red. *Limitation*: its extreme rigidity makes 3/8" Riblath unsuitable for contour plastering; use Diamond Mesh Lath. Due to 3/8" rib, min. ground thickness must be 1".

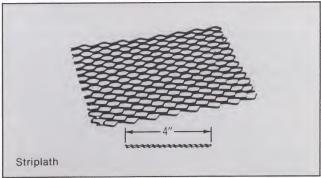
					Bundle Qty.			
Approx.	Lath Wt.	Fir	nish	No.		Wt.	Area	
lb/yd²	(kg/m²)	Ptd.	Galv.	Pcs.	lb	(kg)	yd²	(m²)
3.4	(1.8)	x	х	10	68	(30.8)	20	(16.7)



USG Expanded Metal Stuccomesh is a 1%" x 31%" diamond mesh pattern designed as a base for exterior stucco, hand- or pump-applied. Size 48"x 96" (1220x2440 mm); weight: 3.6 lb/yd²; finish: painted. Limitations: should be furred 1/4" from sheathing and applied to wood framing with 11/2" galvanized nails. When used over sheathing other than wood, fasten with longer nails providing minimum penetration of 11/8" into studs.

Approx.	Lath Wt.	Fir	nish	No.		Wt.	A	Area	
lb/yd²	(kg/m²)	Ptd.	Galv.	Pcs.	Ib	(kg)	yd²	(m ²)	
3.6	(2.0)	Х	_	10	128	(58.1)	35.6	(29.8	





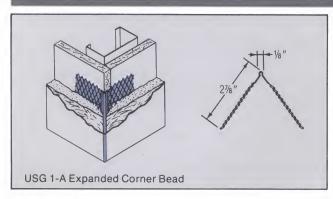
for plaster

Cornerite and Striplath are 8-ft. (2440 mm) long strips of painted Diamond Mesh Lath used as reinforcement.

Cornerite is selvedge bent lengthwise in the center to form a 100° angle, to be used: in all internal plaster angles where metal lath is not carried around, over nonferrous lath and anchored to the lath, over internal angles of masonry constructions, in the "floating angle" method of applying gypsum lath to wood framing in order to reduce plaster cracking.

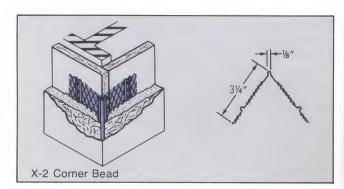
Striplath is a flat strip, used similarly as a plaster reinforcement over joints of non-metallic lathing bases and where dissimilar bases join; also to span pipe chases.

						Bundle (lty.		
	Leg	or Width		No.		Wt.		Lgth.	
Product	in	(mm)	Finish	Pcs.	lb	(kg)	ft	(m)	
0	2	(50.8)	Painted	75	54	(24.5)	600	(183.0)	
Cornerite	3	(76.2)	Painted	75	79	(35.8)	600	(183.0)	
Striplath	4	(101.6)	Painted	75	54	(24.5)	600	(183.0)	



1-A Expanded Corner Bead is galvanized steel, has wide expanded flanges that are easily flexed. Preferred for irregular corners. Provides increased reinforcement close to nose of bead.

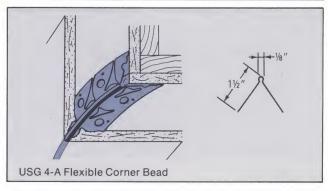
	FI	Flange			Carton Qty.					
	Width				No. Wt.		Wt.	Lgth.		
Product	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
1-A Expnd.	27/8	(72.0)	8	(2440)	40	63	(28.5)	320	(97.3)	
Corner Bead	2 1/8	(73.0)	10	(3050)	30	59	(26.7)	300	(91.2)	



for plaster

X-2 Corner Bead of galvanized steel has full 3¼" flanges easily adjusted for plaster depth on columns—ideal for structural tile corners with rough masonry. Has perforated stiffening ribs along expanded flange.

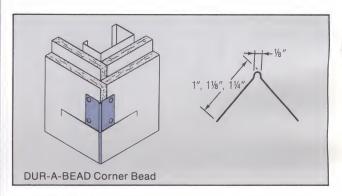
	FI	Flange				Carton Qty.				
	Width		Length		No.	Wt.		L	gth.	
Product	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
X-2 Corner Bead	31/4	(82.6)	10	(3050)	30	76	(34.4)	300	(91.5)	



for plaster

USG 4-A Flexible Corner Bead is an economical general-purpose galvanized steel corner bead. By snipping flanges, this bead may be bent to any curved design (for archways, telephone niches, etc.). Can be secured to corners with 9-A Corner Bead Clips attached to flanges.

	FI	Flange				Carton Qty.				
Product	Width		Length		No.	Wt.		Lgth.		
	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
4-A Flex. Corner Bead	11/2	(38.1)	8	(2440)	30	43	(19.5)	240	(73.2)	

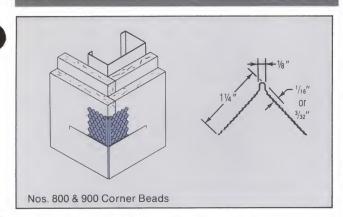


for drywall

DUR-A-BEAD Corner Bead is an all-metal, galvanized steel reinforcement for protecting external corners of SHEETROCK Brand Gypsum Panels. It is nailed, screwed or clinched on to framing through the panels and concealed with U.S.G. joint compounds as a smooth, finished corner. New improved bonding agent provides additional protection against delamination of joint compound from steel.

	FI	ange					Carton Q	ty.	
	Width		Length		No.	١	Wt.	Lgth.	
Product	in	(mm)	ft-in	(mm)	Pcs.	lb	(kg)	ft	(m)
DUR-A-BEAD Corner Bead									
No. 101	1	(25.4)	6-8 8-0 10-0	(2030) (2440) (3050)	75 63 50	53 53 53	(24.0) (24.0) (24.0)	500 504 500	(152.5 (153.7 (152.5
No. 103	11/4	(31.7)	6-10 8-0 10-0	(2080) (2440) (3050)	75 63 50	67 66 65	(30.4) (29.9) (29.5)	512 504 500	(156.2 (153.7 (152.5
No. 104	1 1/8	(28.6)	6-8 8-0	(2030) (2440)	75 63	58 58	(26.3) (26.3)	500 504	(152.5 (153.7

Corner Beads



for drywall and veneer finishes

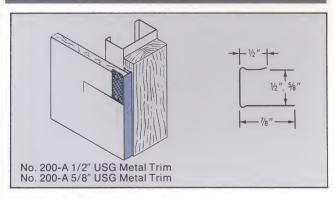
No. 800 Corner Bead is a galvanized steel external corner reinforcement with special .070" grounds for use with both drywall and one-coat veneer partition surfaces. The 11/4" wide fine-mesh expanded flanges, tapered along outer edges for improved concealment and easier finishing, prevent chattering.

In drywall application, it is easily nailed or stapled to framing through panels and provides superior key for joint compounds while eliminating shadowing. For one-coat veneer plaster finishes, it provides the needed 1/16" grounds and approx. 90 keys per lin. ft. for excellent bonding and strong, secure corners, yet uses less material than beads with larger diamond pattern.

No. 900 Corner Bead is galvanized steel, used with two-coat veneer systems to provide 3/32" grounds. With 11/4" fine-mesh flanges either stapled or nailed, it provides effective plaster key and eliminates shadowing.

	FI	ange			Carton Qty.						
		Width		Length		Wt.		Lgth.			
Product	in	(mm)	ft	(mm)	No. Pcs.	lb	(kg)	ft	(m)		
Expanded Flange Corner Bead											
No. 800	11/4	(31.8)	8 10	(2440) (3050)	60 60	40 50	(18.1) (22.7)	480 600	(146.4) (183.0)		
No. 900	11/4	(31.8)	8	(2440) (3050)	60 60	44 54	(19.9) (24.5)	480 600	(146.4) (183.0)		

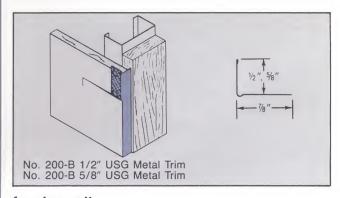
Trim Accessories & Mouldings



for drywall

No. 200-A USG Metal Trim is a strong, channel-type galvanized steel casing that provides maximum protection and neat finished edges to gypsum panels around window and door openings. Joints are butted together and the installation is completed with a U.S.G. joint compound for a smooth, ready-to-paint surface.

					Carton Qty.					
	Depth		Length		No.	Wt.		Lgth.		
Product	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
USG Metal Trim	1/2	(12.7)	7 10	(2130) (3050)	50 50	37 53	(16.7) (23.8)	350 500	(106.8) (152.5)	
No. 200-A (U-shaped)	5/8	(15.9)	7 10	(2130) (3050)	50 50	40 58	(18.2) (26.1)	350 500	(106.8) (152.5)	

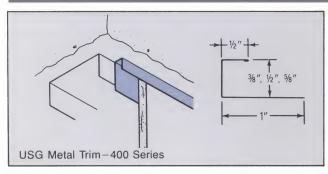


for drywall

No. 200-B USG Metal Trim is galvanized steel, and has an L-shaped edge with installed appearance similar to No. 200-A trim. Elimination of back flange simplifies installation. For use with 1/2" and 5/8" gypsum panels. Installation is completed by application of a U.S.G. joint compound.

						Carton Qty.				
	Depth		Length		No.	Wt.		Lgth.		
Product	in	(mm)	ft	(mm)	Pcs.	ib	(kg)	ft	(m)	
USG Metal Trim	1/2	(12.7)	7 10	(2130) (3050)	50 50	28 40	(12.7) (18.1)	350 500	(106.8) (152.5)	
No. 200-B (L-shaped)	5/8	(15.9)	7 10	(2130) (3050)	50 50	32 45	(14.3) (20.4)	350 500	(106.8) (152.5)	

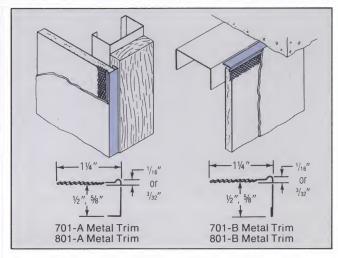
5 Trim Accessories & Mouldings



for drywall

USG Metal Trim – 400 Series are reveal-type, galvanized steel trims used for door or window openings. Also provides a clean trim line at intersections or where gypsum panels abut dissimilar surfaces such as columns and window mullions. No finishing with joint compound is required with these trims.

					Carton Qty.					
	Depth		Length		No.	Wt.		Lgth.		
Product	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
USG Metal Trim 400 Series										
No. 400	3/8	(9.5)	7 8 9 10	(2130) (2440) (2745) (3050)	50	47 54 61 68	(30.6) (24.5) (27.6) (30.8)	350 400 450 500	(106.8 (122.0 (137.3 (152.5	
No. 401	1/2	(12.7)	7 8 9 10	(2130) (2440) (2745) (3050)	50	49 56 63 70	(22.2) (25.4) (28.5) (31.7)	350 400 450 500	(106.8 (122.0 (137.3 (152.5	
No. 402	5/8	(15.9)	7 8 9 10	(2130) (2440) (2745) (3050)	50	53 60 68 75	(23.8) (27.2) (30.6) (34.0)	350 400 450 500	(106.8 (122.0 (137.3 (152.5	



for drywall and veneer finishes

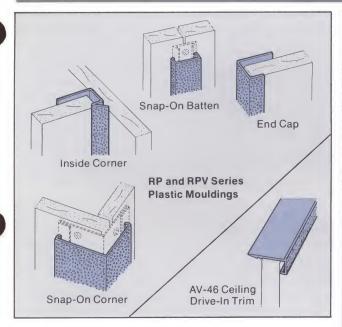
USG Metal Trim comes in two styles, depths and grounds, all of 30-ga. galvanized steel for veneer finishing, to provide neat edge protection at cased openings and ceiling or wall intersections. Fine-mesh expanded flanges strengthen veneer plaster bond and eliminate shadowing. Sizes to fit 1/2" and 5/8" IMPERIAL Gypsum Base.

Type 701 provides 3/32" grounds for two-coat veneer systems. Type 801 gives 1/16" grounds for one-coat veneer systems and drywall. Style "A" is a channel-type casing for nailing to window or door bucks, Style "B" an angle edge trim for use at junction of gypsum base with rough concrete or masonry ceiling.

							Carton Qty.				
	5	Size		Finish Lgth.		No.		Wt.	1	gth.	
	in	(mm)		ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
701-A (1)	1/2 5/8	(12.7) (15.9)	Galv	7 10	(2134) (3050)	50 50	35 53	(15.9) (24.0)	350 500	(106.7) (152.5)	
701-B (1)	1/2 5/8	(12.7) (15.9)	Galv	10 10	(3050) (3050)	50 50	37 40	(16.8) (18.1)	500 500	(152.5) (152.5)	
801-A (2)	1/2 5/8	(12.7) (15.9)	Galv	8 10	(2438) (3050)	50 50	38 52	(17.2) (23.6)	400 500	(121.9) (152.5)	
801-B (2)	1/2 5/8	(12.7) (15.9)	Galv	8 10	(2438) (3050)	50 50	28 39	(12.7) (17.7)	400 500	(121.9) (152.5)	

(1) 3/32" grounds for two-coat veneers.

(2) 1/16" grounds for drywall and one-coat veneers.



for drywall

RP and RPV Series Mouldings are used with painted SHEETROCK Brand Gypsum Panels or predecorated TEXTONE Vinyl-faced Gypsum Panels to cover panel joints, protect corners and trim panel edges. They are precision-extruded of rigid vinyl plastic, and are easily cut, mitered and applied with nails, staples or screws.

RP Series is available in four solid colors of Ivory, Tan, Chocolate and Black. RPV Series Mouldings are factorylaminated to vinyl matching TEXTONE Panel facings.

	Size	(1)	Carton	Approx. Wt.		
Product	Depth	Length	Qty.	lb/1000 f	(kg/100 m)	
RP-2, RPV-2 Inside Corners RP-4, RPV-4 End Caps	5/8", 1/2"	9'(2)	(4)	155, 190	(23.1), (28.3)	
RP-5, RPV-5 Snap-on Corners	(3)	9' (2)	(4)	440	(65.5)	
RP-7, RPV-7 Snap-on Battens	(3)	9'(2)	(4)	190	(28.3)	

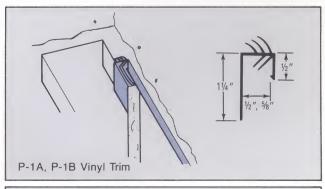
- (1) Metric equivalents: depths-3/8"=9.5 mm, 1/2"=12.7 mm, 5/8"=15.9 mm; lengths-8 ft.=2440 mm, 9 ft.=2745 mm, 10 ft.=3050 mm.
- Also available, in 8- and 10-ft. lengths. One depth fits all panel thicknesses.
- (4) Packaged per order

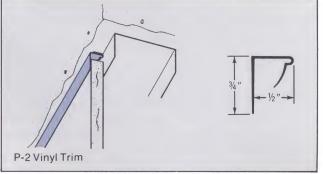
AV-46 Ceiling Drive-In TEXTONE Trim is used with predecorated TEXTONE Vinyl-faced Gypsum Panels to cover joints at the ceiling. Precision-extruded aluminum and covered with vinyl matching TEXTONE Panel facings. Easily cut and mitered.

	Size	(1)	Carton	Appr	ox. Wt.
Product	Depth	Length	Qty.	lb/1000 ft	(kg/100 m)
AV-46 Ceiling Drive-in Trim	1/2", 5/8"	12'	(2)	154	(22.9)

(1) Metric equivalents; depths -1/2'' = 12.7 mm, 5/8'' = 15.9 mm; length -12 ft. = 3660 mm.

(2) Packaged per order



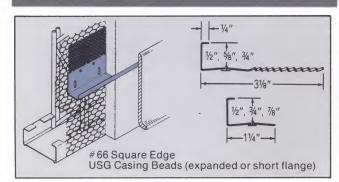


for drywall and veneer finishes

USG P-1A/B Vinyl Trims are reveal-type white vinyl trims with rigid flanges and integral flexible fins that compress on installation. Fins form permanent, flexible seal to effectively block sound transmission, replace caulking, provide structural-stress relief at panel perimeter. Fit tightly over edges of either 1/2" or 5/8" SHEETROCK Brand Panels or IMPERIAL Gypsum Base. Provide acoustical seal comparable in performance to one bead of acoustical sealant. Help to stop condensation where board terminates at metal surface. Require no finishing compound; paint easily.

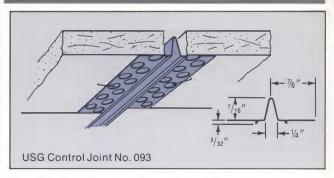
USG P-2 Vinyl Trim is a channel-shaped vinyl trim with a pressure-sensitive adhesive backing for attachment to the wall at wall-ceiling intersections in both drywall and veneer finish systems. Provides positive perimeter relief in radiant heat ceilings. Allow 1/8" to 1/4" clear space for insertion.

		Size					Carton Qty.					
	Depth		Length		No.	Wt.		Lgth.				
Product	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)			
USG Vinyl Trim												
P-1A	1/2	(12.7)	8 10	(2440) (3050)	50 50	40 50	(18.1) (22.7)	400 500	(122.0) (152.5)			
P-1B	5/8	(15.9)	8 10	(2440) (3050)	50 50	42 53	(19.0) (24.0)	400 500	(122.0)			
P-2	1/2	(12.7)	10	(3050)	50	23	(10.2)	500	(152.5)			



USG Casing Beads are used as a plaster stop and as exposed trim around window and door openings; also recommended at junction or intersection of plaster and other wall or ceiling finishes. May be used with USG Metal Lath, ROCKLATH Plaster Base or masonry construction. In order to insure proper grounds for plastering, 3/4" casing beads are recommended for use with metal lath, 5/8" beads with all masonry units, 7/8" beads when flange is applied *under* ROCKLATH Plaster Base, 1/2" beads when the flange is applied *over* ROCKLATH Plaster Base. Available in galvanized steel and zinc.

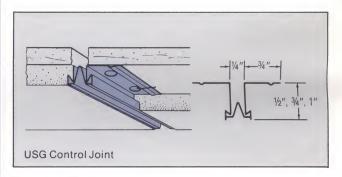
	De	pth or				Carton Qty.				
Product &	Grounds		Length		No.	Wt.		Lgth.		
Flange Type	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
USG Casing Bead, #66	1/2	(12.7)	8 10	(2440) (3050)	40 30	69 65	(21.1) (19.8)	320 300	(97.6) (91.5)	
	5/8	(15.9)	10	(3050)	30	72	(22.0)	300	(91.5)	
Square, Expanded	3/4	(19.1)	8 10	(2440) (3050)	40 30	82 77	(25.0) (23.5)	320 300	(97.6 (91.5	
USG Casing Bead, #66 Square, Short	1/2	(12.7)	10	(3050)	30	54	(16.5)	300	(91.5	
	3/4	(19.1)	10	(3050)	30	61	(18.6)	300	(91.5	
	7/8	(22.2)	10	(3050)	30	64	(19.5)	300	(91.5	



for drywall and veneer finishes

USG Control Joint No. 093 is used to relieve stresses of expansion and contraction across the joint in large ceiling and wall areas in drywall and veneer finish systems. Used from floor to ceiling in long partition runs and from door header to ceiling. Also recommended for repair of existing plastered masonry. Made of roll-formed zinc to resist corrosion, has 3/32" grounds. Plastic tape protects 1/4" opening 7/16" deep, and is removed after installation. Limitation: where sound transmission and/or fire ratings are prime considerations, an adequate seal must be provided behind control joint.

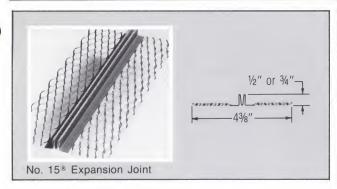
		Size				Carton Qty.				
Product	Grounds		Lgth.		No.	Wt.		Lgth.		
	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
USG Control Joint #093	3/32	(2.4)	10	(3050)	25	28	(12.5)	250	(76.3)	



for plaster

USG Control Joint relieves stresses of expansion and contraction in large plastered areas. Made of roll-formed zinc alloy, resistant to corrosion in both interior and exterior uses with gypsum or portland cement plaster. A 1/4" open slot is protected with plastic tape which is removed after plastering is completed. *Limitation:* where sound transmission and/or fire ratings are prime considerations, adequate protection must be provided behind the control joint. Should not be used with magnesium oxychloride cement stuccos or stuccos containing calcium chloride additives.

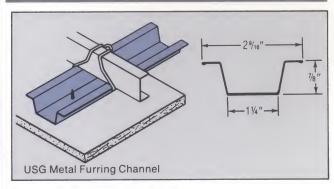
					Carton Qty.					
	Flang	Flange Width		ange Width Lgth.		No.	No. Wt.		Lgth.	
Product	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)	
USG Control Joint #50 #75 #100	1/2 3/4	(12.7) (19.0) (25.4)	10 10 10	(3050) (3050) (3050)	25 25 25	43 48 54	(19.3) (21.5) (24.4)	250 250 250	(76.3) (76.3) (76.3)	



No. 15 Expansion Joint relieves stresses of expansion and contraction in large plastered areas. Available in galvanized steel.

						(Carton Qty		
	Grounds Depth		Lgth.		No.		Wt.		gth.
Product	in	(mm)	ft	(mm)	Pcs.	Ib	(kg)	ft	(m)
#15 Expansion Joint	1/2 3/4	(12.7) (19.0)	10 10	(3050) (3050)	24 24	74 74	(33.6) (41.3)	240 240	(73.2) (73.2)

Furring Accessories 2

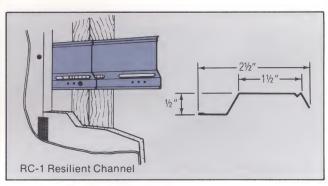


for drywall and plaster

USG Metal Furring Channel is a roll-formed, hat-shaped section available in two gauges of galvanized steel. The DWC channel is for attachment of SHEETROCK Brand Gypsum Panels, IMPERIAL Gypsum Base or ROCKLATH Plaster Base in ceiling construction. Also provides noncombustible furring for interior of exterior walls. The heavier DWC-20 channel permits greater spans and load capacity.

			Size			Bundle Qty.				
	Thkns.	hkns. Width Lgth. No		No.	٧	Vt.	L	jth.		
Product	ga	in	(mm)	ft	(mm)	Pcs.	Ib	(kg)	ft	(m)
USG Metal Furring Channel DWC DWC-20 (1)	25 20	2 ⁹ /16 2 ⁹ /16	(65.1) (65.1)	12 12	(3660) (3660)	10	34 62	(15) (28)	120 120	(36.6

(1) Same channel shape/size, but no hems on flanges.



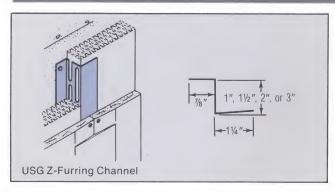
for drywall and plaster

RC-1 Resilient Channel, made of minimum 25-ga. galvanized steel, is one of the most effective, lowest-cost methods of reducing sound transmission through partitions and ceilings. Flange is prepunched for resilient screw attachment of SHEETROCK Brand Gypsum Panels or IMPERIAL and USG R.H. Gypsum Bases to wood framing.

		Size					Bundle Qty.			
	Sect.			Lgth.			Wt.	Lgth.		
Product	in	(mm)	ft	(mm)	No. Pcs.	lb	(kg)	ft	(m)	
RC-1 Resilient Channel	1/2 x 25/8	(12.7 × 66.7)	12	(3660)	20	48	(21.7)	240	(73.2	

8

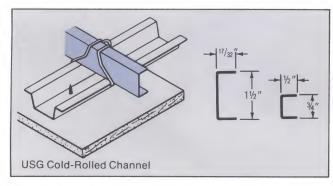
Furring Accessories



for drywall and plaster

USG Z-Furring Channel, made of minimum 24-ga. hot-dip galvanized steel, is used to attach rigid FOAMULAR Polystyrene Insulation and other types of insulation, and SHEETROCK Brand Gypsum Panels, IMPERIAL Gypsum Base or ROCKLATH Plaster Base to interior side of masonry walls. Furring helps minimize effects of structural stresses; prevents wicking of moisture to inside surfaces. Also used with THERMAFIBER Z-Furring Blankets when fire-resistant construction is required.

		Si	ze		Bundle Qty.					
	D	Depth		Lgth.		Wt.		Lgth.		
Product	in	(mm)	ft	(mm)	No. Pcs.	lb	(kg)	ft	(m)	
USG Z-Furring Channel	1 1½ 2 3	(25.4) (38.1) (50.8) (76.2)	81/2	(2590)	25	49 57 66 85	(22.2) (25.8) (29.9) (38.5)	212.5 212.5 212.5 212.5	(64.8) (64.8) (64.8) (64.8)	

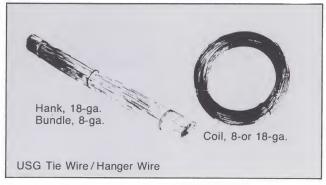


for drywall and plaster

USG Cold-Rolled Channel, of 16-ga. steel, is used to laterally brace studs and for furring walls and ceilings; also for suspended ceilings, partition construction and ornamental lathing. Available either galvanized or black asphaltum painted.

		Si	ze				Bundle Q1	y.	
	D	epth	L	gth.	No.	٧	Vt.	Lgth.	
Product	in	(mm)	ft	(mm)	Pcs.	lb	(kg)	ft	(m)
USG Cold-Rolled	3/4	(19.0)	16 20	(4880) (6100)	20 20	96 120	(43.5) (54.4)	320 400	(97.6) (122.0)
Channel*	1 1/2	(38.2)	16 20	(4880) (6100)	10 10	80 100	(36.2) (45.4)	160 200	(48.8) (61.0)

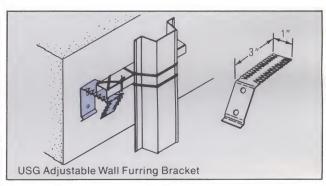
^{*}Also available in 2-in. depth upon request.



for drywall and plaster

USG Tie Wire is 18-ga. galvanized soft annealed steel wire used in drywall and plaster construction to tie furring channel to runners; also to tie metal lath to channel in plaster construction. USG Hanger Wire is 8-ga. galvanized steel, for hanging 1½" runner channels in both drywall and plaster suspended ceilings.

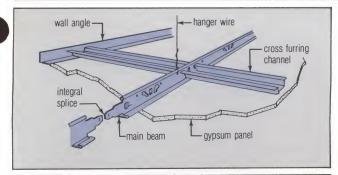
				Pa	ackagin	g/Quant	ity	
	S	Size	Die	No.	١	Wt.	L	gth.
Product	ga.	(mm)	Pkg. Unit	Lgths. /Pkg.	lb	(kg)	ft	(m)
USG Tie Wire/								
Hanger Wire:								
coiled	8	(4.1)	Coil	1	100	(45)	1429	(436)
coiled	18	(1.2)	Coil	1	100	(45)	16620	(5066)
straight lengths:								
12-ft. (3660 mm) lgths.	8	(4.1)	Bdl.	119	100	(45)	1429	(436
48-in. (1220 mm) lgths.	18	(1.2)	Hank	2077	50	(23)	8310	(2533
28-in. (710 mm) lgths.	18	(1.2)	Hank	1782	25	(11)	4155	(1266

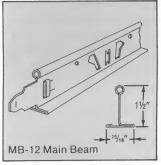


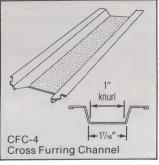
for drywall and plaster

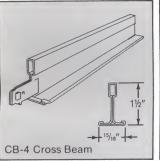
USG Adjustable Wall Furring Brackets are used for attaching 3/4" furring channels and USG Steel Studs to interior side of exterior masonry walls. Made of 20-ga. galvanized steel with corrugated edges, brackets are attached to masonry and act as supports for steel studs 24" o.c. in braced furring systems.

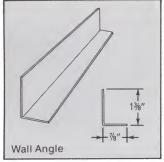
		Carton Qty.		
		Wt.		
Product	No. Pcs.	lb	(kg)	
USG Adjustable Wall Furring Bracket	500	29	(13)	











for drywall and veneer finish ceilings

USG Direct Suspension System is a direct-hung steel ceiling grid for screw application of gypsum panels and veneer finish systems in commercial and industrial buildings. This module system, consisting of simple, snaplock parts, provides labor-savings from fast erection, and 1-, 2- and 3-hour Underwriters Laboratories Inc. fire ratings. Makes all other similar suspension systems obsolete. The 4 basic components:

MB-12 Main Beam, standard heavy-duty 12-ft. prepunched and indexed tee beam, notched 8 in. o.c. for Cross Furring Channel at 16 and 24 in. o.c. Splices without clips or plates.

CFC-4 Cross Furring Channel simply locks into main beam, accommodates incandescent fixtures. Knurled surface and 25-ga. metal make screw penetration quick

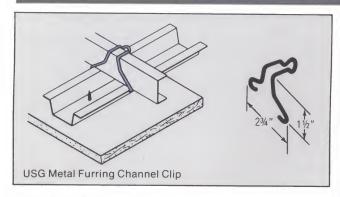
Wall Angle simplifies attachment of cross furring channel and provides backup for gypsum panels at wall.

CB-4 Cross Beam supports edge of standard lay-in light

(See also Section 11 for alternate ceiling systems.)

				age			Carton	Qty.	
	L	ength	(qty./installed ceiling area)		No.	Wt.		Lgth.	
Product	ft	(mm)	1000 ft²	(100 m ²)	Pcs.	1b	(kg)	ft	(m)
MB-12 Main Beam	12	(3660)	300	(98.4)	20	67	(30)	240	(73.2)
CFC-4 Cross Furring Channel	4	(1220)	750 (1) 500 (2)	(246.1)(1)- (164.1)(2)	30	40	(18)	120	(36.6)
Wall Angle	10	(3050)	(3)	(3)	10	22	(10)	100	(30.5)
CB-4 Cross Beam	4	(1220)	(4)	(4)	60	67	(30)	240	(73.2)

- (1) When used at 16 in. (406 mm) o.c. (2) When used at 24 in. (610 mm) o.c.
- (3) One lin. ft. required per lin. ft. of wall or column perimeter
- (4) Varies according to no. and size of light fixtures.



USG Metal Furring Channel Clips, made of galvanized wire, are used in attaching USG Metal Furring Channels to 1½" cold-rolled channel ceiling grillwork. For use with SHEETROCK Brand Gypsum Panels or with single-layer IMPERIAL Gypsum Base.

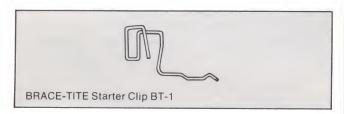
			Carton Qt		1.
	Size		No.	Wt.	
Product	in	(mm)	Pcs.	lb	(kg)
USG Metal Furring Channel Clip	1 1/2	(38.1)	500	20	(9.1)



BRACE-TITE Field Clip BT-1 is used for suspended plaster ceilings. Provides support across full width of lath. For use with standard 3/4" cold-rolled channels.

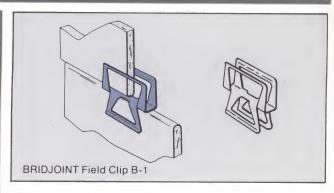
	Us	Usage		Carton Qty.			
Product 100		(qty./installed ceiling area)			Wt.		
	100 yd²	(100 m ²)	No. Pcs.	lb	(kg)		
BRACE-TITE Field Clip BT-1	550-600 ⁽¹⁾ 750-800 ⁽²⁾	(658-718) ⁽¹⁾ (897-957) ⁽²⁾	500	28	(12.7		

(1) With channels at 16 in. o.c. (2) With channels at 12 in. o.c.



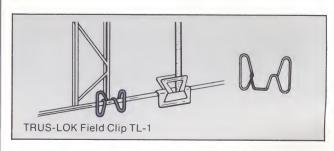
BRACE-TITE Starter Clip BT-1 is used in conjuction with Field Clip BT-1 to start first course of lath.

Product	Carton Qty.		
	No. Pcs.	Wt.	
		lb	(kg)
BRACE-TITE Starter Clip BT-1	500	11	(4.9)



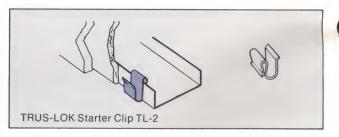
BRIDJOINT Field Clip B-1, used with 3/8" ROCKLATH Plaster Base, supports and aligns those end joints that do not fall opposite structural members.

	Usage		Carton Qty.		
		d ceiling area)	No.		Wt.
Product	100 yd2	(100 m ²)	Pcs.	lb	(kg)
BRIDJOINT Field Clip B-1	350	(419)	500	19	(8.6



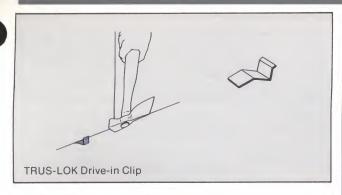
TRUS-LOK Field Clip TL-1 is designed for attaching 3/8" ROCKLATH Plaster Base to TRUSSTEEL Studs.

	Us	age		Carton Qty	1.
		d ceiling area)	No.		Wt.
Product	100 yd ²	(100 m ²)	Pcs.	lb	(kg)
TRUS-LOCK Field Clip TL-1	550-600	(658-718)	1000	26	(11.8



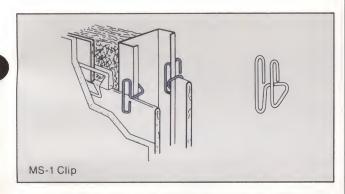
TRUS-LOK Starter Clip TL-2 is used with TL-1 Clips, MS-1 and runner to start first course of lath (adapts to various lath thicknesses).

Product	Carton Qty.		
	No. Pcs.	Wt.	
		lb .	(kg)
TRUS-LOK Starter Clip TL-2	500	8	(3.4)



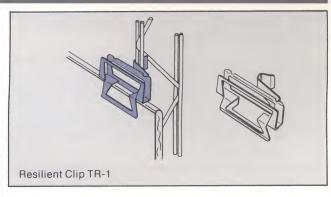
TRUS-LOK Drive-in Clip is used to anchor (1) bottom course of lath in direct attachment to TRUSSTEEL Studs, and (2) top course of lath in partitions to underside of monolithic concrete flat slab or concrete joist filler construction; also as starter-finisher clip with steel stud-ROCKLATH Base partition.

		Carton Qty.	
		Wt.	
Product	No. Pcs.	lb	(kg)
TRUS-LOK Drive-In Clip	500	11	(5.0)



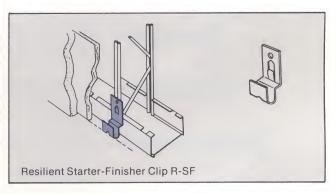
MS-1 Clip attaches 3/8" ROCKLATH Plaster Base direct to ST, STL and CWS style USG Steel Studs.

	Usage			Carton Qt	у.
		(qty./installed ceiling area)			Wt.
Product	100 yd²	(100 m ²)	No. Pcs.	lb	(kg)
MS-1 Clip	550-600	(658-718)	1000	22	(10.0)



Resilient Clip TR-1 attaches 3/8" ROCKLATH Plaster Base to TRUSSTEEL Studs spaced 16" o.c., furs lath 3/8" from stud face.

	115	sage		Carton Qty.		
(qty./ins		(qty./installed ceiling area)			Wt.	
Product	100 yd²	(100 m ²)	No. Pcs.	lb	(kg)	
Resilient Clip TR-1	550-600	(658-718)	250	17	(7.7)	



Resilient Starter-Finisher Clip R-SF is used with starting and finishing courses of ROCKLATH Plaster Base resiliently-attached on TRUSSTEEL Snap-in Runner.

		Carton Qty.	
			Wt.
Product	No. Pcs.	lb	(kg)
Resilient Starter-Finisher Clip R-SF	250	6	(2.5)

USG Curtain Wall Slide Clip provides for curtain wall stud attachment with allowance for building movement—detailed on page 5.

USG Screws for Drywall, Load-Bearing and Plaster Construction

USG Screws are the result of many years of development aimed at producing the best results in both drywall and plaster construction. They constitute a complete line of special self-drilling, self-tapping steel screws to improve attachment and simplify installation. All are corrosion-resistant and, except for the Hex Washer Head Type, have a Phillips-head recess for rapid installation with special bit and power-screwdriver.

Type S screws have a patented drill point and special-

design threads that minimize thread-stripping, provide maximum holding power in ST, STL and CWS steel studs. Type S-12 screws are for use with 20- to 12-ga. steel framing members. Special threads on Types G and W screws speed installation and provide excellent holding power in gypsum base and wood framing respectively.

Curtain wall framing requires cadmium-plated screws for installation of gypsum sheathing, self-furring metal lath over gypsum sheathing or brick ties over gypsum sheathing to steel studs. Type S for steel 20-ga. and lighter, Type S-12 for 18-ga. and heavier.

				Pac	kaging		
Attachment of:			Bulk		1	ndiv. Pkg.	
Gypsum Panels to Steel Framing		Quantity	Approx. Wt.		Quantity		ox. Wt.
	Application	(1000 pcs.)	ib	(kg)	(1000 pcs.)	lb/pkg.	(kg/pkg.
	1" (25.4 mm) Type S, Bugle Head 1/2" or 5/8" single-layer gypsum panels to steel framing. Specify cadmium plated for exterior curtain wall.	10	36	(16.3)	2	6.0 (1)	(2.7)
	11/4" (28.6 mm) Type S, Bugle Head Attachment of 5/8" gypsum panels to RC-1 Channels Also used to attach batten strips for Demountable Partition System.	8	32	(14.5)	2	7.0 (1)	(3.2)
- intimination	114" (31.8 mm) Type S, Bugle Head Attachment of 1" coreboard to metal angle	8	34	(15.4)	2	8.0 (1)	(3.6)
	15%" (41.3 mm) Type S, Bugle Head 1/2" or 5/8" double-layer gypsum panels to steel framing	5	28	(12.7)	1	6.0 (1)	(2.7)
	17/4" (47.6 mm) Type S, Bugle Head 1/2" gypsum panels to steel runners in solid partitions, through coreboard	4	24	(10.9)	2	12.0 (2)	(5.4)
	2¼" (57.2 mm) Type S, Bugle Head 5/8" gypsum panels to steel runners in solid partitions, through coreboard	2.5	19	(8.6)	1	8.0 (2)	(3.6)
and apply the second se	2%" (66.7 mm) Type S, Bugle Head 1" double-layer coreboard to steel studs, runners	2.5	24	(10.9)	1	10.0 (2)	(4.5)
	3" (76.2 mm) Type S, Bugle Head Multi-layer special materials to steel studs, runners	2	23	(10.4)	1	13.0 (2)	(5.9)

Screws 10

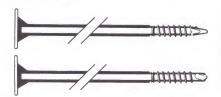
				Pack	aging		
Attachment of:		Bulk			Indiv. Pkg.*		
Gypsum Panels to Steel Framing		Quantity	Appr	ox. Wt.	Quantity	Approx. Wt.	
2,500	Application	Quantity (1000 pcs.)	Ib	(kg)	(1000 pcs.)	lb/pkg.	(kg/pkg.)
	1" (25.4 mm) Type S-12, Bugle Head 1¼" (31.8 mm) Type S-12, Bugle Head Attachment of single-layer 1/2" and 5/8" gypsum panels and sheathing to steel framing up to 12-ga. Specify cadmium plated for exterior curtain wall.	10 8	35 35	(15.9) (15.9)	2 2	6.5 ⁽¹⁾ 7.5 ⁽¹⁾	(2.9) (3.4)
	1%" (41.3 mm) Type S-12, Bugle Head Attachment of double-layer 1/2" and 5/8" gypsum panels to steel framing up to 12 ga.	5	27	(12.2)	1	5.5 (1)	(2.5)
	1%" (47.6 mm) Type S-12, Bugle Head 2" (50.8 mm) Type S-12, Bugle Head 2%" (60.3 mm) Type S-12, Bugle Head 2%" (66.7 mm) Type S-12, Bugle Head 3" (76.2 mm) Type S-12, Bugle Head For use in multi-layer application of gypsum panels and other compatible materials to 12-ga. steel framing.	4 4 3 2.5 2	25 26 24 24 23	(11.3) (11.8) (10.9) (10.9) (10.4)	2 2 1 1 1	12.0 (2) 12.0 (2) 8.0 (2) 10.0 (2) 13.0 (2)	(5.4) (5.4) (3.6) (4.5) (5.9)

Attachment of: Metal to Metal

			Pack	aging		
		Bulk		li li	ndiv. Pkg.*	
	Quantity	Appr	ox. Wt.	Quantity	Appro	x. Wt.
Application	(1000 pcs.)	lb	(kg)	(1000 pcs.)	lb/pkg.	(kg/pkg.)
3/8" (9.5 mm) Type S, Pan Head Attachment of Style ST or STL steel studs to runners.	16	47	(21.3)	5	11.0 (2)	(5.0)
3/8" (9.5 mm) Type S-12 Pan Head Attachment of (1) Style CWS steel studs to runners, (2) door frames to steel studs and clips. (3) any metal-to- metal attachment, combined thicknesses equivalent to 12-ga., maximum.	16	47	(21.3)	5	11.0 (2)	(5.0)
1/2" (12.7 mm) Type S-12, Pan Head For use with all stud styles and steel, combined thicknesses equivalent to 12-ga., maximum. Has a heavier shank, assuring easier entry in door frames and clips having extremely hard steel.	14	48	(21.8)	3	10.0 (2).	(4.5)
1/2" Type S-12, Pancake Head Attaches metal lath to steel framing	12	49	(22.2)	3	12.0 (2)	(5.4)
11/4" (31.8 mm) Type S-12, Pancake Head, cad. pltd. Attachment of USG Self-Furring Metal Lath, through gypsum sheathing, to steel studs and runners; also of brick wall ties over gypsum sheathing to curtain wall studs. Also available in Type S (for 20-25 ga. steel)	5	34	(15.4)	2	8.0 (2)	(3.6)
3/4" Type S-4, Hex Washer Head For steel-to-steel attachment, combined thicknesses equivalent to double 12-ga., maximum.	3	40	(18.1)	_	_	-
1/2" (12.7 mm) Type S-12, Low Profile Head For use with all stud styles and steel up to 12-ga.	14	48	(21.8)	3	10.0 (2)	(4.5)
5/8" (15.9 mm) Type S-12, Low Profile Head (Framing Screw) For steel-to-steel attachment, maximum double 14-ga. thicknesses.	10	36	(16.3)	2	8.0 (2)	(3.6)
1/2" (12.7 mm) Type S-16, Pan Head, cad. pltd. For use in framing demountable partitions.	14	48	(21.8)	3	10.0 (2)	(4.5)

Screws

Attachment of: Rigid Foam Insulation to Steel Framing



	Packaging							
	Bulk			Indiv. Pkg.*				
	Quantity Approx. Wt.		Quantity	Appr	ox. Wt.			
Application	(1000 pcs.)	lb	(kg)	(1000 pcs.)	ib/pkg.	(kg/pkg.)		
11/2" (38.1 mm) Type R or S-12, Wafer Head	4.0	30	(13.6)	1	8 (2)	(3.6)		
2" (50.8 mm) Type R or S-12, Wafer Head	3.0	32	(14.5)	1	16 (3)	(7.3)		
21/2" (63.5 mm) Type R or S-12 Wafer Head	2.0	27	(12.2)	1	14(3)	(6.4)		
3" (76.2 mm) Type R or S-12, Wafer Head Attachment of rigid foam insulation direct or through gypsum sheathing to steel studs (Type R-22-25 ga.; Type S-12-14-20 ga.)	1.5	23	(10.4)	.750	12 (3)	(5.4)		

				Pac	kaging		
Miscellaneous Attachment		Bulk			Indiv. Pkg.*		
miscellaneous Attachment		Quantity		rox. Wt.	Quantity	Approx. Wt.	
	Application	(1000 pcs.)	lb (kg)		(1000 pcs.)	lb/pkg.	(kg/pkg.
Aluminum Trim	7/8" (22.2 mm) Type S-18, Oval Head (cadmium plated) Attachment of aluminum trim items	10	50	(22.7)	2	8.0 (1)	(3.6)
	1¼" (31.8 mm) Type S, Bugle Head (cadmlum plated) For attachment of aluminum trim items in Demountable and ULTRAWALL Partition Systems	8	34	(15.4)	2	8.0 (1)	(3.6)
Gypsum Panels to Wood Framing	1¼" (31.8 mm) Type W, Bugie Head Attachment of single-layer gypsum panels or RC-1 Channels to wood framing	8	33	(15.0)	2	8.3 (1)	(3.8)
Gypsum to Gypsum	1½" (38.1 mm) Type G, Bugle Head Multi-layer gypsum-to-gypsum laminated partitions (not recommended for double-layer 3/8" gypsum board). Temporary attachment only; laminating adhesive required	5	33	(15.0)	2	11.0 (2)	(5.0)
Plywood to Steel Framing	1 ¹⁵ /16" (49.2 mm) Type S-12, Bugle Head, Pilot Point Attachment of 3/8", 1/2", 5/8", or 3/4" thick plywood to steel joists or studs. Will penetrate double thickness 14-ga. steel.	3	36	(16.3)	1	12.0 (2)	(5.4)
Steel Framing to Concrete/Block	Acorn Slotted-HWH TAPCON® Anchors: 3/16"×1¼" (4.8×31.8 mm) 3/16"×1¾" (4.8×41.3 mm) 1/4"×1¾" (6.4×31.8 mm) 1/4"×1¾" (6.4×31.8 mm) 1/4"×2¾" (6.4×51.2 mm) 1/4"×2¾" (6.4×59.9 mm) Attachment of steel framing components to poured concrete and concrete block (also available with Flat Head).	1 1 1 .5 .5	9 11 14 9 11	(4.1) (5.0) (6.4) (4.1) (5.0) (5.9)	-	-	

^{*}Also avail. in master ctn. as footnoted: (1) 8-pkg. master ctn. also avail. (2) 4-pkg. master ctn. also avail. (3) 2-pkg. master ctn. also avail.

			Packaging					
Attachm	ent of:		Bulk			Indiv. Pkg.*		
Wood to	Steel Framing		Quantity	Approx. Wt.		Quantity	Approx. Wt.	
		Application	(1000 pcs.)	lb	(kg)	(1000 pcs.)	lb/pkg.	(kg/pkg.)
		1" (25.4 mm) Type S, S-12, Trim Head 1%" (41.3 mm) Type S, S-12, Trim Head Attachment of wood trim over single-layer gypsum	12 6	33 29	(14.9) (13.2)	4 2	12.0 ⁽²⁾ 9.0 ⁽²⁾	(2.7) (4.1)
		panels to steel framing. Type S for Styles ST/CR and STL/CRL; S-12 for Style CWS/CWR.						
		2¼" (57.2 mm) Type S, S-12, Trim Head Attachment of wood trim over double-layer gypsum panels to steel framing. Type S for Styles ST/CR and STL/CRL; S-12 for Style CWS/CWR.	4	27	(12.2)	2	13.0 (2)	(5.9)
		1¼" (31.8 mm) Type S, Oval Head 1¾" (41.3 mm) Type S, Oval Head	-	_	_	2	8.0 (2) 8.0 (1)	(3.6)
	THERE STRUMENT	2¼" (57.2 mm) Type S, Oval Head		_	_	1	8.0 (2)	(3.6)
	The state of the s	2%" (73.0 mm) Type S, Oval Head	_	_	_	1	14.0 (2)	(6.4)
		3¾" (95.2 mm) Type S, Oval Head Attachment of wood cabinets to steel framing	_	_	_	1	18.0 (2)	(8.2)
						-		

^{*}Also avail. in master ctn. as footnoted: (1) 8-pkg. master ctn. also avail. (2) 4-pkg. master ctn. also avail. The products described herein are covered by one or more of the following U.S. patents:

Nos. 3,207,023; 3,221,588; 3,204,442; 3,260,100.

SUPER-TITETM Screws are a superior line of self-drilling, self-tapping steel screws for drywall and plaster construction. They provide excellent results for most interior framing requirements at economical cost. A deep, sharp Phillips-head recess, mated with the SUPER-TITE Bit Tip for positive, nonslip control, eliminates spinouts. Fast penetration afforded by specially-designed threads and self-

drilling point assure lower in-place cost. Bugle head screws in six sizes attach gypsum panels to 20- or 25-ga. steel framing, and a 11/4" Type W Bugle Head screw also is available for attaching gypsum panels to wood framing. The 7/16" Pan Head screw for attaching steel studs to runners can penetrate double-thickness 25-ga., steel. SUPER-TITE Screws meet ASTM C646.

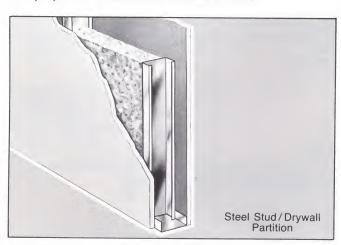
Packaging

	Acab mant		P	Bulk		
Miscellaneous Attachment			Quantity		ox. Wt.	
		Application	Quantity (1000 pcs.)	lb	(kg)	
		1" Bugle Head Attaches 1/2" or 5/8" single-layer gypsum panels to steel framing	10	32	(14.5)	
		11/s" Bugle Head Attaches 5/8" gypsum panels to RC-1 Channels or other steel framing, also batten strips for Demountable Partitions	10	35	(15.9)	
		1¼" Bugle Head Attaches 1" coreboard to steel runners	8	30	(13.6)	
		11%" Type W Bugle Head Attaches 1/2" or 5/8" single-layer gypsum panels, or RC-1 Channels, to wood framing	8	30	(13.6)	
		1%" Bugle Head Attaches double-layer gypsum panels to steel framing	5	25	(11.3)	
	<u></u>	2 1/4" Bugle Head 3" Bugle Head Attaches multiple layers of gypsum panels and other compatible materials to steel framing	3 2	23 23	(10.4) (10.4)	
· ·	Special Framer	7/16" Pan Head Attaches 25-ga. steel studs to runners	10	26	(11.8)	

Limiting Height Tables

USG Steel-Framed Drywall and Plaster Systems

Partition/Limiting Height Data shown in the following tables gives limiting heights of partition systems for specific loads and stud sizes. For additional information on section properties of various studs see SA-923.



limiting heights-steel stud assemblies

stud desig.	stud width	stud spacing	allow. defl.	partition, one layer	partition, two layers	furring one layer
USG Steel	l Studs (cws)				
212CWS	21/2"	16"	1/120 1/240 1/360	17'9"d 14'0"d 12'3"d	18'6"d 14'9"d 13'0"d	16'6"d 13'0"d 11'6"d
		24"	1/120 1/240 1/360	15'6"d 12'3"d 10'9"d	16'3"f 13'0"d 11'3"d	14'6"d 11'6"d 10'0"d
358CWS	35%"	16"	1/120 1/240 1/360	23'0"d 18'3"d 16'0"d	24′0″d 19′0″d 16′6″d	21′9″d 17′3″d 15′0″d
		24"	1/120 1/240 1/360	20'0"d 16'0"d 14'0"d	20′9″f 16′6″d 14′6″d	19′0″d 15′0″d 13′3″d
400CWS 4	4"	16"	1/120 1/240 1/360	24′9″d 19′6″d 17′3″d	25′9″d 20′3″d 17′9″d	23'6"d 18'9"d 16'3"d
		24"	1/120 1/240 1/360	21'6"d 17'3"d 15'0"d	22'0"f 17'9"d 15'6"d	20'6"d 16'3"d 14'3"d
600CWS	6"	16"	1/120 1/240 1/360	33′6″d 26′6″d 23′3″d	34'6"d 27'6"d 24'0"d	32′3″d 25′6″d 22′3″d
		24"	1/120 1/240 1/360	29'3"d 23'3"d 20'3"d	29'6"f 24'0"d 21'6"d	28'0"d 22'3"d 19'6"d

Limiting height for ½" or %" thick panels and 5 psf uniform load perpendicular to partition or furring. Use one-layer heights for unbalanced assemblies. Limiting criteria: d – deflection, f – bending stress. Consult local code authority for limiting criteria. Use 1/240 limiting height as maximum deflection criterion for studs surfaced with veneer plaster systems. For complete veneer plaster limiting height information, see catalog SA-912.

limiting heights-steel stud assemblies

stud desig.	stud width	stud spacing	allow. defl.	partition, one layer	partition, two layers	furring one layer
				The second secon		still.
JSG Stee	i Studs (ST)				
158ST	15/8"	16"	1/120 1/240 1/360	10'9"f 9'6"d 8'3"d	10′9″d 10′6″d 9′0″d	10'3"d 8'3"d 7'3"d
		24"	1/120 1/240 1/360	8'9"f 8'3"d 7'3"d	8′9″f 8′9″f 8′0″d	8′9″f 7′3″d 6′3″d
212ST	21/2"	16"	1/120 1/240 1/360	13'9"f 12'6"d 10'9"d	13'9"f 13'6"d 11'9"d	13′9″d 11′0″d 9′9″d
		24"	1/120 1/240 1/360	11'3"f 10'9"d 9'6"d	11'3"f 11'3"f 10'3"d	11'3"f 9'9"d 8'6"d
358ST	3%"	16"	1/120 1/240 1/360	16′9″f 16′0″d 14′0″d	16'9"f 16'9"f 14'9"d	16′9″f 14′6″d 12′9″d
		24"	1/120 1/240 1/360	13'6"f 13'6"f 12'3"d	13′6″f 13′6″f 13′0″d	13'6"f 12'9"d 11'0"d
400ST	4"	16"	1/120 1/240 1/360	17'3"f 17'3"d 15'0"d	17′3″f 17′3″f 15′9″d	17′3″f 15′9″d 13′9″d
		24"	1/120 1/240 1/360	14'3"f 14'3"f 13'0"d	14'3"f 14'3"f 13'9"d	14'3"f 13'9"d 12'0"d
600ST	6"	16"	1/120 1/240 1/360	20'0"f 20'0"f 20'0"f	20'0"f 20'0"f 20'0"f	20'0"f 20'0"f 18'9"d
		24"	1/120 1/240 1/360	16'3"f 16'3"f 16'3"f	16'3"f 16'3"f 16'3"f	16'3"f 16'3"f 16'3"f

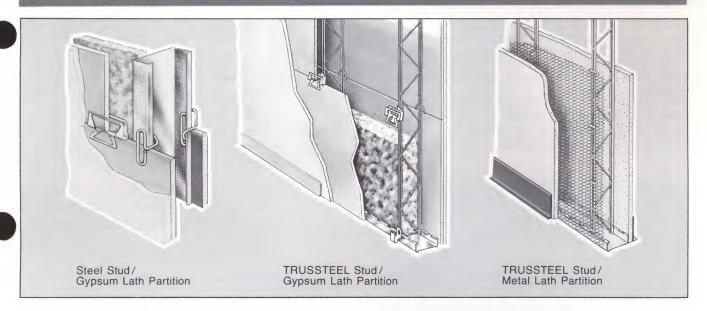
Limiting height for 1/2" or 5%" thick panels and 5 psf uniform load perpendicular to partition or furring. Use one-layer heights for unbalanced assemblies. Limiting criteria: d – deflection, f – bending stress. Consult local authority for limiting criteria. Use 1/240 limiting height as maximum deflection criterion for studs surfaced with veneer plaster systems. For complete veneer plaster limiting height information, see catalog SA-912.

limiting heights-steel stud assemblies

stud desig.	stud width	stud spacing	allow. defi.	partition, one layer	partition, two layers	furring one layer	
ISG Stee	i Studs (STL)					
158STL	15%"	16" & 24"	1/120 1/240 1/360	8′0″f 8′0″f 7′0″d	8′0″f 8′0″f 7′9″d	8'0"f 6'9"d 6'0"d	
212STL	21/2"	16" & 24"	1/120 1/240 1/360	9'9"f 9'9"f 9'3"d	9′9″f 9′9″f 9′9″f	9′9″f 9′0″d 8′0″d	
358STL	3%"	16" & 24"	1/120 1/240 1/360	12'0"f 12'0"f 11'9"d	12'0"f 12'0"f 12'0"f	12'0"f 12'0"f 10'6"d	

Limiting height for ½" or ¾" thick panels and 5 psf uniform load perpendicular to partition or furring. Use one-layer heights for unbalanced assemblies. Limiting criteria: d—deflection, f—bending stress. Consult local code authority for limiting criteria. Use 1/240 limiting height as maximum deflection criterion for studs surfaced with veneer plaster systems. For complete veneer plaster limiting height information, see catalog SA-912.

Limiting Height Tables 11



limiting height-steel stud/gypsum lath partitions

a deced	ntud	section	nortition	max. partition ht. (1)				
stud style	stud width	modulus	partition thickness	(2)	(3)			
158ST	15/8"	.044 in ³	33/8"	10'6"	8'9"			
212ST	21/2"	.076 in ³	41/4"	13'0"	11'3"			
358ST	35%"	.125 in ³	5%"	16'0"	13'6"			
400ST	4"	.143 in ³	5¾"	17'3"	14'3"			
600ST	6"	.255 in ³	7¾"	20'0"	16'3"			

(1) Reduce ceiling height by 15% if lightweight aggregate basecoat is used. Limiting heights based on L/360 deflection. (2) For 16" stud spacing. (3) For 24" stud spacing.

limiting height-TRUSSTEEL Stud/metal lath partitions

	Section	Finished Thickness	Max. Partition Height				
Stud Size	Modulus (in ³)	Diamond Mesh or 1/8" Riblath	studs 16" o.c.	studs 19" o.c.			
15/8"	.0635	31/8"	9'	_			
21/2"	.1056	4"	15'	14'			
31/4"	.1420	43/4"	21'	18'			
4"	.1825	51/2"	22	20'			
6"	.2770	71/2"	26'	24'			

(1) Limiting heights based on L/360 deflection, 1/8" 3.4-lb. Z-riblath.

limiting height-TRUSSTEEL Stud/gypsum lath partitions

	Section	Finished	Thickness	Max. Partition Height		
Stud Size	Modulus (in³)	Direct Attach.	Resil. Attach.	with studs 16" o.c.(2×3)		
15/8"	.0635	35/8"	(1)	9'		
21/2"	.1056	41/2"	43/4"	15'		
31/4"	.1420	51/4"	51/2"	21'		
4"	.1825	6"	61/4"	22'		
6"	.2770	8"	81/4"	26'		

- (1) Not recommended for resilient attachment.(2) Resilient partition limiting height is 10°.(3) Limiting heights based on L/360 deflection.

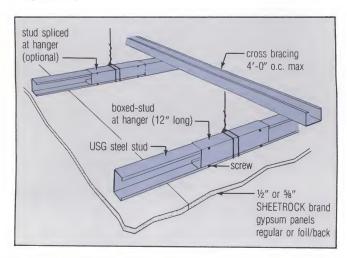
-	
Steel Stud Chase Wall	

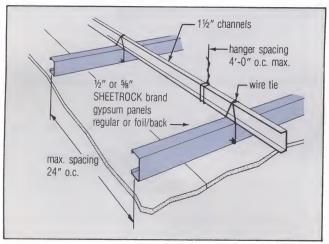
limiting height-chase wall partitions (1)

stud desig.	stud width	stud spacing	allow. defl.	one layer	two layers
				20007202200	
ISG Steel	Studs (ST & CWS)			
158ST	1%"	16"	1/120 1/240 1/360	15′3″f 13′3″d 11′6″d	15′3″f 14′6″d 12′9″d
		24"	1/120 1/240 1/360	12'6"f 11'6"d 10'0"d	12'6"f 12'6"f 11'0"d
212ST 2½"	21/2"	16"	1/120 1/240 1/360	20′3″f 17′6″d 15′6″d	20′3″f 19′0″d 16′6″d
		24"	1/120 1/240 1/360	16'6"f 15'6"d 13'6"d	16'6"f 16'6"f 14'6"d
358ST	3%"	16"	1/120 1/240 1/360	25′9″f 22′9″d 19′9″d	25′9″f 24′3″d 21′3″d
		24"	1/120 1/240 1/360	21′0″d 19′9″d 17′3″d	21'0"f 21'0"f 18'6"d
212CWS	21/2"	16"	1/120 1/240 1/360	24′3″d 19′3″d 17′0″d	25′9″d 20′6″d 18′0″d
		24"	1/120 1/240 1/360	21′3″d 17′0″d 14′9″d	22'6"f 18'0"d 15'9"d

(1) Limiting height for ½" or ¾" thick panels and 5 psf uniform load perpendicular to partition. Limiting criteria: d—deflection, f—bending stress. Consult local code authority for limiting criteria. Use 1/240 limiting height as maximum deflection criterion for studs surfaced with veneer plaster systems. For complete veneer plaster limiting height information, see catalog SA-912.

USG Steel Stud Ceiling System uses USG Steel Studs of the four sizes in each of the ST and CWS style lines. They rigidly suspend screw-attached gypsum panel and veneer finish ceilings in commercial and industrial buildings. The system is especially advantageous where these studs are already on the job for use in partitions and/or curtain walls. For stud-span/deflection data, spacings, and hanger loads, see following information; for alternate drywall/plaster ceiling attachments to structural members, see "Furring Accessories" and "Clips", Sections 8 and 9, respectively.



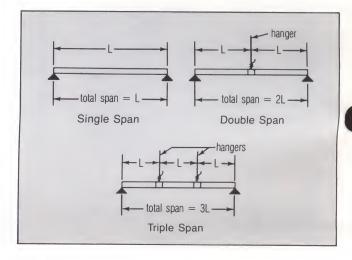


USG Metal Furring Channel Ceiling System uses either DWC or DWC-20 Metal Furring Channels suspended from cold-rolled channels—see page 17—to fur gypsum panel / plaster-base ceilings in commercial and industrial buildings. Allowable spans are shown below; for additional details, see SA-923 or SA-912, for gypsum panel or plaster surfacing, respectively.

limiting span (1)-USG metal furring channel system

channel style		DV	VC	DWC-20		
channel spacing-in.		16	24	16	24	
single span						
-7	2.5	5′9″	5′0″	6'11"	6'0"	
uniform load — psf (2)	5.0	4'7"	4'0"	5′5″	4'9"	
por (2)	6.6	4'2"	3'8"	5'0"	4'4"	
riple span						
	2.5	7'1"	6'2"	8'6"	7′5″	
uniform load —psf (2)	5.0	5'8"	4'11"	6'9"	5′11	
po. (±)	6.6	5'2"	4'6"	6'2"	5′5″	

(1) Based upon allowable uniform design load or maximum deflection limitation of L/240, whichever produces the shorter span. Concentrated loads such as light fixtures, exhaust fans, etc. should be investigated separately. (2) Based upon 2.5 ps ff or one-layer, 5.0 psf for two-layer, gypsum panels; 6.6 psf for 7/8" plaster over 1/2" ROCKLATH Plaster Base.



hanger loads

Ceiling	Load per Hanger (lb)							
Framing Spacing	Double Span	Triple Span						
12" o.c.	1.23 WL	1.10 WL						
16" o.c.	1.66 WL	1.45 WL						
24" o.c.	2.50 WL	2.20 WL						

 $W = ceiling load (lb/ft^2)$. L = span (ft)

limiting span (1)-USG steel stud ceiling system

stud style		212ST		358ST*				400ST* 212CWS			3	358CWS			400CWS			6	00CWS	*		
stud spacing-	-in.	12	16	24	12	16	24	12	16	24	12	16	24	12	16	24	12	16	24	12	16	24
ngle span																						
uniform load - psf	5	11'0"	10'0"	8'9"	14'9"	13'3"	11'0"	16'0"	14'6'	12'3"	13'6"	12'3"	10'9"	18'0"	16'3"	14'3"	19'6"	17'6"	15'6"	26'9"	24'3"	21'3'
	10	8'9"	8'0"	6'3"	11'0"	8'3"	5′6″	12'3"	10'9"	8'9"	10'9"	9'9"	8'6"	14'3"	13'0"	11'3"	15'6"	14'0"	12'3"	21'3"	19'3"	16′9′
	15	7′9″	6'3"	4'3"	7'6"	5'6"	_	10'0"	8'9"	7'0"	9'3"	8'6"	7'6"	12'6"	11'3"	9'9"	13'6"	12'3"	10'3"	18'6"	16'9"	13'3'
	20	6'3"	4'9"	_	5'6"	4'3"	_	8'9"	7'6"	6'3"	8'6"	7′9″	6'6"	11'3"	10'3"	8'3"	12'3"	11'0"	9'0"	16'9"	14'6"	9'9'
uble and triple spa	n																-					
	5	12'0"	10'6"	8'0"	14'3"	11'9"	8'9"	17'3"	14'9"	12'0"	14'9"	13'6"	11'9"	19'9"	17'9"	15'6"	21'3"	19'3"	16'9"	29'6"	26'9"	22'0'
uniform load —psf	10	8'0"	6'6"	5′0″	8'9"	7′0″	5'3"	12'0"	10'3"	8'3"	11'9"	10'9"	9'3"	15'6"	14'3"	11'9"	16'9"	15'3"	12'0"	23'0"	18'3"	14'0'
	15	6'0"	5'0"	_	6'6"	5'3"	_	9'9"	8'3"	6'9"	10'3"	9'3"	7'6"	13'6"	11'9"	9'9"	14'3"	12'0"	9'3"	17'0"	14'0"	10'6'
	20	5′0″	4'0"	_	5'3"	4'0"	_	8'0"	7'3"	5′9″	9'3"	8'0"	6'6"	11'6"	10'3"	8'3"	12'0"	10'0"	7'6"	14'0"	11'6"	8'6"

⁽¹⁾ Based upon AISI Specifications for the Design of Cold-Formed Steel Structural Members and UBC Standard No. 27-9, for allowable design load or maximum deflection limitation of L/240, assuming bracing of top flange at 48" o.c., maximum, whichever produces the shorter span. *Stud end-stiffening required.

U.S.G. Product Literature References

Catalogs

Joint Treatment & Texture Products, J-375 U.S.G. Plaster and Veneer Products Catalog, P-529 Rebuilding America, X-1135

Handbooks & Manuals

Gypsum Construction Handbook, H-17 Gypsum Shaft Wall Manual, CS-8 THERMAFIBER Insulation Handbook, IW-453

Specification Data Sheets

Gypsum Panel Series-

SHEETROCK Brand Regular & FIRECODE Gypsum Panels, WB-1473
Foil-Back SHEETROCK Brand Gypsum Panels, WB-1405
USG Exterior Gypsum Ceiling Board, WB-1152
USG Triple-Sealed Gypsum Sheathing, GS-107
SHEETROCK Brand W/R Gypsum Panels, WB-634
USG Gypsum Sheathing, GS-102
SHEETROCK Brand SW Gypsum Panels, WB-1507

Joint Treatment Series-

PERF-A-TAPE Reinforcing Tape, J-67 USG Ready-To-Use Joint Compounds, J-60 USG Vinyl-Base Powder Joint Compounds, J-47 DURABOND Joint Compounds, J-17

Texture Finish Series-

USG Multi-Purpose Texture Finish, J-383
USG Spray Texture Finish, J-377
USG Texture XII Drywall Surfacer, J-382
IMPERIAL QT Texture Finish—Regular & Coarse, P & PC; J-378
IMPERIAL QT Texture Finish—Fine, LCNC; J-379
IMPERIAL QT Texture Finish—Regular & Coarse, V & VC; J-380
IMPERIAL QT Texture Finish—Regular & Coarse, ST & STC; J-381

Plaster Series-

Basecoat Plasters from U.S.G., P-515 Gauging Plasters from U.S.G., P-518 Gypsum Plaster Bases from U.S.G., P-516 IMPERIAL Tape, P-517

Construction Steel Series-

USG Area Separation Walls, CS-15

USG Control Joints, CS-18

RC-1 Resilient Channels, CS-19

USG Steel Framing, CS-24

USG Z-Furring Channels, CS-27

USG Corner Bead & Metal Trim, CS-29

USG Screws, CS-31

USG Direct Suspension System, CS-38

USG Steel Framing Manual, CS-54

USG Joist Web Stiffener, CS-76

USG Wafer Head Insulation Screws, CS-85

SUPER-TITE Screws, CS-89

Architectural Technical Literature

USG Steel Framing, SA-510

THERMAFIBER Building and Acoustical Insulation, SA-705

THERMAFIBER Fire-Safety Systems, SA-707

FOAMULAR Extruded Polystyrene Insulation, SA-710

USG Curtain Wall Systems, SA-805

Veneer Plaster and Steel Framing, SA-912

Veneer Finish and Wood Framing, SA-913

Steel-Framed Gypsum Lath & Plaster, SA-915

USG Plasters, Bases & Accessories, SA-917

USG Cavity Shaft Wall Systems, SA-922

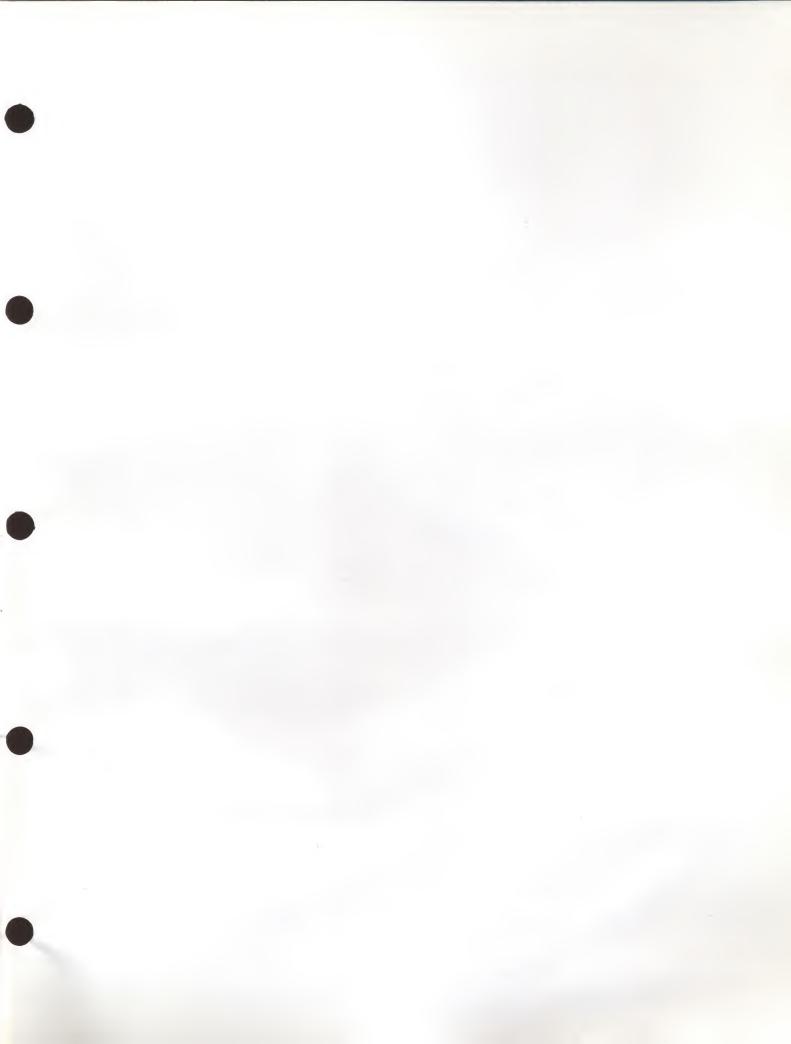
USG Steel-Framed Drywall Systems, SA-923

USG Drywall/Wood Frame Systems, SA-924

USG Area Separation Walls, SA-925

Gypsum Panels & Accessories, SA-927

TEXTONE Vinyl-Faced Gypsum Panels, SA-928



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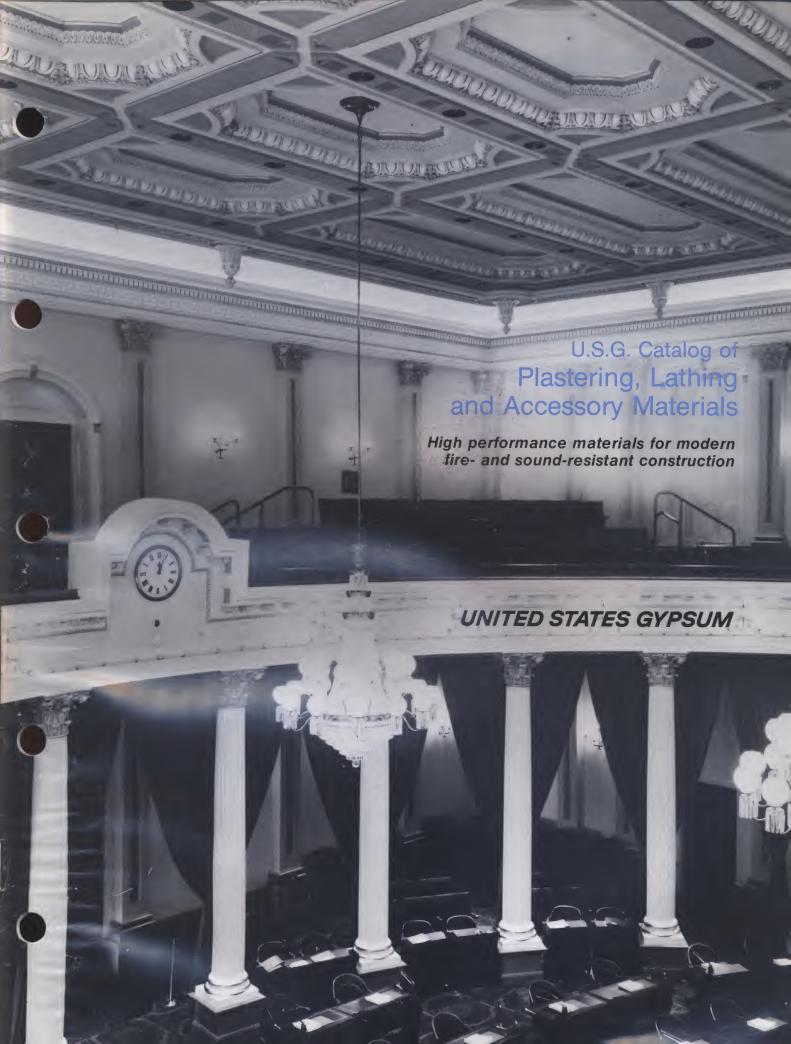
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Plasters, Limes, Bases and Accessories

The lathing and plastering products of United States Gypsum have earned overwhelming preference in the building industry for one reason: *reliable performance*.

This performance record extends through the complete U.S.G. line—broadest in the industry—of plaster and lime products, plaster bases and accessories, all designed to work together in a wide range of engineered wall and ceiling systems. Coming from a single source, they are most capable of satisfying specific job requirements.

U.S.G. plastering materials are designed to provide improved function and utility while reducing construction time and cost. Manufacture of these products to carefully controlled standards insures uniform quality. Strategically located plants produce and/or stock these plastering materials. U.S.G. trademarks are your assurance of consistently high-quality products with proven performance to meet your needs.



Gypsum plasters applied over metal lath easily form to smooth contoured surfaces (below) or highly ornamental panels and decorative ceilings (on cover).

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GYPSUM BASECOAT PLASTERS

These provide a plastic working material which conforms to most designs and helps achieve the ultimate quality in durable walls and ceilings. They can be applied either by hand or machine methods, on gypsum or metal lath; gypsum or clay tile; concrete or cinder blocks, or other approved plaster bases.

RED TOP Gypsum Plaster, preferred for its low cost and excellent workability, must be job-aggregated. Three types: Regular—for sand aggregate, hand application; LW—for lightweight aggregate, hand application; Machine Application—for sand or lightweight aggregate; perlite not recommended when vertical lift exceeds 30 ft. or hose length is over 150 ft. Meets ASTM C28 and Fed. Spec. SS-P-00402B, Type II. In 100-lb. bags.

REDTOP Wood Fiber Plaster develops higher strengths than other conventional gypsum plasters. Recommended as scratch coat over metal lath. One cu. ft. sand per 100 lb. plaster must be added for machine application or use over masonry bases and may be added for other applications. Meets ASTM C28 and Fed. Spec. SS-P-00402B, Type III. In 50- and 100-lb. bags.

RED TOP Two-Purpose Plaster, suitable for machine or hand application, reduces inventory requirements. Must be job-aggregated; perlite not recommended when vertical lift exceeds 30 ft. or hose length is over 150 ft. Meets ASTM C28 and Fed. Spec. SS-P-00402B, Type II. In 100-lb. bags.

STRUCTO-LITE Gypsum Plaster, containing mill-mixed perlite aggregate, is preferred in cold weather when aggregate may freeze, or when suitable aggregate is not readily available. Lighter weight and greater insulation value than sanded basecoats. Three types: Regular—for gypsum or metal lath; Masonry—for high-suction unit masonry;



Type S—for specific UL-listed assemblies. Not recommended over metal lath when smooth-trowel lime finish is used or machine application when vertical lift exceeds 30 ft. or hose length is over 150 ft. Meets ASTM C28 and Fed. Spec. SS-P-00402B, Type I. In 80-lb. bags.

STRUCTO-BASE Gypsum Plaster— develops higher strength than conventional plasters. Ideal for handball courts, hospital corridors, schools, etc. requiring high-strength basecoat. Superior as sanded scratch and brown coat over metal lath. Meets ASTM C28 and Fed. Spec. SS-P-00402B, Type II. In 100-Ib. bags.

Specification—Gypsum Basecoat Plasters

			Positional		400000		•				
		-	egate (vol.)/	approx. cor	•				on of gypsum		
		, ,		Strongth	, ,	gypsu	ım lath	metal lath		unit n	nasonry
plaster product	mix	ft ³ /100 lb	m³/ft (5)	(psi) lbf/in²	MPa (4)	yd²/ton	m²/ton (5)	yd²/ton	m²/ton (5)	yd²/ton	m²/ton (5
STRUCTO-LITE RED TOP Wood Fiber RED TOP Wood Fiber	regular neat sand	 1.0	0.62	700 1750 1400	4.82 12.06 9.65	140 135	129 124	75 (3) 50 70	69 (3) 46 64	135 105	124 97
	Garia					100			01	100	- 01
STRUCTO-BASE	sand sand sand	2.0 2.5 3.0	1.25 1.56 1.87	2800 min. 1900 min. 1400 min.	19.30 13.10 9.65	165	152	100	92	165	152
RED TOP Gypsum and Two-Purpose Plasters	sand sand sand	2.0 2.5 3.0	1.25 1.56 1.87	875 750 650	6.00 5.17 4.48	210	193	115	106	185	170
	perlite perlite	2.0 3.0	1.25 1.87	700 525	4.82 3.62	185	170	90	83	150	138
	vermiculite vermiculite	2.0 3.0	1.25 1.87	465 290	3.21 2.00	180	165		***	165	152

⁽¹⁾ Average laboratory results when tested in accordance with ASTM C472. Figures may vary slightly for products from individual plants. (2) Grounds (including finish coat): gypsum lath—½" (face of lath), metal lath—¾" (back of lath), unit masonry—%". (3) Lightweight aggregated plasters are not recommended over metal lath when the finish coat is to be smooth troweled. (4) Megapascal (MN/m²). (5) Metric ton.

Gauging Plasters and Finishing Limes

GAUGING PLASTERS

When blended with finish lime putty, gauging plaster produces a finish plaster with controlled set, early hardness and strength, and resistance to cracking.

CHAMPION and STAR Gauging Plasters are selected for white, smooth-trowel or sand-float lime-putty finishes. Effectively resist cracking, provide hardness and abrasion resistance required for normal interior walls and ceilings. Applied over gypsum basecoat. Job-aggregated, sand-float finish may be job-colored. Available in Regular, unaggregated; "Quality", with perlite fines or fine sand for lightweight-aggregated basecoats. When mixed with recommended proportions of lime putty, CHAMPION Plaster sets in 20-30 min.; STAR Plaster in 40-60 min. Meet ASTM C28 and Fed. Spec. SS-P-00402B, Type V. In 50- and 100-lb. bags.

RED TOP Gauging Plaster blends easily with lime putty for durable, smooth-trowel or sand-float finishes in residential construction. Provides high strength, hardness and abrasion resistance superior to many other surfaces. Usually darker in color than CHAMPION and STAR gauging; easily painted or decorated. Applied over a gypsum basecoat. Available in Regular, unaggregated; "Quality", with perlite fines for lightweight-aggregated basecoats. Two types: Quick Set (30-40 min.); Slow Set (50-70 min.). Meets ASTM C28 and Fed. Spec. SS-P-00402B, Type V. In 100-lb. bags.

STRUCTO-GAUGE Plaster, mixed with lime putty, produces high-strength, durable, white, smooth-trowel finish for high-traffic areas. Excellent hardness and abrasion resistance to withstand abuse. Faster and easier to apply than Keene's Cement. Used over high-strength wood fiber or sanded gypsum basecoats. Not for use over light-weight-aggregated or portland cement basecoats or masonry. Two types: Slow Set (60-75 min.) for regular sanded basecoats; Quick Set (30-40 min.) for low-suction veneer basecoats. Meets ASTM C28 and Fed. Spec. SS-P-00402B, Type V. (5,000 psi compressive strength when tested in accordance with ASTM C472.) In 100-lb. bags.

Gauged-Lime Finishes—Coverage⁽²⁾

				approx. coverage over (2)					
		ratio o (dry			ntional ecoat	IMPERIAL Basecoat			
product	lime	gauging	sand (1)	yd²/ton	m ² /t (3)	ft²/ton	m²/t (3)		
CHAMPION, STAR and RED TOP Gauging	2 2	1	8	390 280	360 260	440 320	410 300		
STRUCTO-GAUGE Gauging	1 2	1	_	380 430	350 400	420 440	390 410		
RED TOP Keene's Cement	2 1 1	1 2 2	8 -8	270 370 270	250 340 250	310 370 290	290 340 270		

⁽¹⁾ Natural, uniformly graded, clean silica sand.

RED TOP Keene's Cement, high-strength, white plaster mixed with lime putty, provides durable, highly crack-resistant, sand-float finish for schools, hospitals, other hard-wear surfaces. The only retemperable gypsum plaster. Ideal for job-coloring or tinting plasters for large areas. As a smooth-trowel finish, offers strong, hard surfaces when densified by extensive troweling through set. Requires high-strength gypsum basecoat. Two types: Regular (3-6 hr. set); Quick Trowel (1-2 hr. set). Meets ASTM C61 and Fed. Spec. SS-C-161A Type I (Regular), Type II (Quick Trowel). In 100-lb. bags.

FINISHING LIMES

These provide bulk, plasticity and ease of spread for the finish coat. There are two types: (1) double hydrate and (2) normal hydrate. The latter requires soaking in order to produce a good finish lime putty.

Ivory and Snowdrift Finish Limes are fine, white, double-hydrate products for superior finishing over basecoat plasters. Specially formulated to blend with gauging plasters and water into a smooth-troweling, highly workable finish. Autoclaved hydration (over 92%) speeds mixing and virtually eliminates surface defects caused by delayed hydration. Meet ASTM C206, Type S and Fed. Spec. SS-L-351B, Type F. In 50-lb. bags.

RED TOP and GRAND PRIZE Finish Limes are single-hydrated, white materials requiring overnight soaking (16 hr.) before use and blending with gauging plasters. Easy-working properties and product uniformity for economical results. Meet ASTM C6, Type N and Fed. Spec. SS-L-351B, Type F. In 50-lb. bags.



^{(2) 1/16&}quot; (1.6mm) thickness, total mix. (3) Metric ton.

VENEER BASECOAT AND FINISH PLASTERS

Veneer finishes, applied to only ½16 to ¾32" thickness, trim days from plastering schedules and provide high strength and smooth, monolithic surfaces. They require only the addition of clean water; may qualify for fire ratings up to four hours and sound ratings up to 62 STC in steel and wood-frame assemblies.

IMPERIAL Basecoat is a high-strength basecoat (compressive strength 3,000 psi). Applied 1/16 to 3/32" thick over IMPERIAL Gypsum Base, direct to concrete block or over a bonding agent to monolithic concrete; provides high coverage. For either hand or machine application. Meets ASTM C587 and Fed. Spec. SS-P-00402B, Type VI. In 80-lb. bags.

IMPERIAL Finish offers high-strength, abrasion-resistant finish over IMPERIAL Gypsum Base in one-coat system or over IMPERIAL Basecoat Plaster in a two-coat system. Applied to nom. 1/16" thickness; excellent coverage produces low applied cost with hand-applied formulation. Meets ASTM C587 and Fed. Spec. SS-P-00402B, Type VI. In 80-lb. bags.

IMPERIAL Finishes—Coverage

	ft ²	/ton	m²/ton (metric) (1)			
product	gypsum base	masonry & mono. conc.	gypsum base	masonry & mono. conc.		
IMPERIAL Basecoat	3250—4250	2700—3600	335—435	275—370		
IMPERIAL (1-coat) Finish	3500—4000	not recommended	360—410	not recommended		
IMPERIAL (2-coat) Finish	3200—3600	not applicable	330—370	not applicable		

⁽¹⁾ Coverage rounded to nearest 5m2.

DIAMOND Interior Finish provides a strong, hard surface suitable for commercial or residential construction. Hand-applied 1/16" thick over IMPERIAL Base or over a bonding agent on monolithic concrete. Also suitable in a two-coat system over IMPERIAL Basecoat or a sanded gypsum basecoat. Exceptionally high coverage, fast application provides cost savings where extreme hardness of IMPERIAL Plaster not required. White in color; may be left undecorated if desired especially where float finishing or skip troweling is popular; unaggregated for smooth or skip-trowel finish; may be job-aggregated for float or other texture. Meets ASTM C587 and Fed. Spec. SS-P-00402B, Type VI. In 50-lb. bags.

DIAMOND Interior Finish is also suitable for use with electric cable ceilings. Allows higher operating temperatures than with other products, provides more heat transmission and greater resistance to heat deterioration. Finish is job-sanded and handapplied ³/₁₆" thick to cover cable. A finish coat of the same material is applied ¹/₁₆" to ³/₃₂" thick to bring the total plaster thickness to ½". Applied over special USG R.H. Base attached to wood joists, to metal furring channel or suspended metal

grillage; or over a bonding agent directly to monolithic concrete ceilings to a total thickness of %".

DIAMOND Interior Finish—Coverage

onventional wal	Is and c	eilings					
surface	n	eat		oat finish 1 1:2 (1)	heavy texture finish sanded 1:1 (1)		
applied to	ft²/ton	m²/ton (2)	ft²/ton	m²/ton (2)	ft²/ton	m²/ton	
IMPERIAL Gypsum Base	6000	610	4660	475	3500	355	
IMPERIAL Basecoat	5500	560	4330	440	3250	330	
Sanded RED TOP Basecoat	5000	510	4000	410	3000	305	
monolithic concrete	5500	560	4330	440	3250	330	

surface		fill coat d 1:1 (1)		nish coat d 1:4 (1)	1/16" finish coat sanded 1:1 (1)		
applied to	ft²/ton	m²/ton (2)	ft²/ton	m²/ton (2)	ft²/ton	m²/ton (2)	
USG R.H. Base or monolithic concrete	2300	235	5000	510	3250	330	

⁽¹⁾ Coverage based on one ton of aggregated mixture (combined weight of sand and DIAMOND Finish). (2) Coverage rounded to nearest $5m^2$ per metric ton.

One-coat veneer plasters offer abrasion-resistant, hard surfaces ready for next-day decoration.



FINISH COAT PLASTERS

ORIENTAL Exterior Finish Stucco is a white, water-resistant finish for exterior portland cement-lime basecoats. Mill-prepared; requires water only. Easily hand or spray-applied as float, spatter-dash and other texture finishes; not designed for smooth-trowel finish. One ton covers 150-200 sq. yd. in 1/8" thickness. Available in 9 additional colors Southwest only. In 100-lb. bags.

RED TOP Finish—Mill-mixed gauged interior finish requiring addition of water only. Has stabilized set, excellent troweling characteristics. Two formulations available: *Regular Set*, for use over conventional sanded gypsum basecoat, and *Quick Set*, for use over IMPERIAL Basecoat. Not for use over lightweight aggregate gypsum basecoat. In 50-lb. bags.

SPECIAL PLASTERS, ADDITIVES

USG Moulding Plaster is used for specialized work such as ornamental trim or running cornices. The plaster grain is very fine, ideal for sharp detail when used neat for cast work. Controlled set provides uniform workability. For running cornice work, add a small amount of lime putty to add plasticity and to act as a lubricant for the template. Provides approx. 1.5 cu. ft. per 100 lbs. Complies with ASTM C28 and Federal Specification SS-P-00402B, Type V. In 50- and 100-lb. bags.

RED TOP Retarder and RED TOP Accelerator are available tor use with plaster when required by job or climate conditions. When used in excess, setting and drying problems can arise. Use of too much retarder can weaken plaster finish. In 1½-lb. package (Retarder); in 2-lb. package (Accelerator).



Plaster Bases

ROCKLATH, IMPERIAL and USG R.H. plaster bases are gypsum lath in sheet form providing a rigid base for the economical application of gypsum plasters. A special gypsum core is faced with multi-layered laminated paper designed to check plaster slide, control absorption and resist lath sag. ROCKLATH Bases comply with ASTM C37 and Federal Specification SS-L-30D, Type I. IMPERIAL Bases comply with ASTM C588 and Federal Specification SS-L-30D, Type VI.

GYPSUM VENEER BASES

IMPERIAL Gypsum Base, for IMPERIAL Plaster and DIAMOND Interior Finish, is designed for direct or resilient attachment to wood or steel framing. Regular, FIRECODE and FIRECODE "C" Bases available—the latter two are UL listed.

Foil-Back IMPERIAL Gypsum Base, for veneer plasters, has bright aluminum foil back which meets HUD requirements for a vapor retarder (foil permeability is 0.06 perms), and adds thermal insulation when foil faces a plane air space of ½" to 3½". Regular, FIRECODE and FIRECODE "C" Bases available.

USG R.H. Base is used with DIAMOND Interior Finish in electric cable-heated ceilings. Suitable for nail or screw attachment to wood or steel framing. Core is specially fortified to improve performance and withstand elevated temperatures from electric cables. Regular and FIRECODE "C" bases available. Meets NEC requirements. UL listed.

Specifications—Gypsum Bases

	thic	kness	length	appro	ox. wt	
product	in.	mm	ft. (1)	Ib/1000ft ²	kg/100m ²	
IMPERIAL Base (2) Regular Regular FIRECODE FIRECODE "C" FIRECODE "C"	1/2 5/8 5/8 1/2 5/8	12.7 15.9 15.9 12.7 15.9	8,9,10, 12,14	1820 2320 2330 1990 2480	890 1130 1140 970 1210	
USG R.H. Base Regular Regular FIRECODE "C" FIRECODE	1/2 5/8 1/2 5/8	12.7 15.9 12.7 15.9	8,9,10, 12,14	1840 2400 2000 2400	900 1170 980 1170	

(1) Metric lengths 8 ft=2440mm, 9 ft=2745mm, 10 ft=3050mm, 12 ft=3660mm, 14 ft=4270mm. (2) Also available in Foil-Back Base.

Domed ceiling, curved balcony facings and contoured staircase display the high-quality finishes produced with metal lath and plaster. Cast plaster dentils and other ornaments were shop fabricated of USG Moulding Plaster.



Screw-attached IMPERIAL Gypsum Base offers a high-strength base for veneer plasters.

CONVENTIONAL GYPSUM LATH

Regular ROCKLATH Plaster Base, for conventional basecoat plasters, is suitable for nail, screw or clip attachment to wood or steel framing.

ROCKLATH FIRECODE Plaster Base, for conventional basecoat plasters, has special fire-resistant core used in assemblies providing ratings up to two hours.

Foil-Back ROCKLATH Plaster Base has bright aluminum foil back to provide effective vapor retarder meeting HUD requirements (foil permeability is 0.06 perms) at no extra labor cost. Also provides thermal insulation when installed with foil facing a plane air space of ½" to 3½".

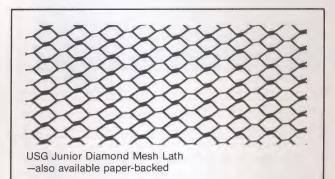
Specifications—ROCKLATH Plaster Bases

ROCKLATH	thickness		wi	width		length		approx. wt.		
Product	in.	mm	in.	mm	in.	mm	pc/ bdl.	lb./1000ft²	kg/100m²	
Regular (1)	3/8	9.5	16	406	48	1220	6	1440	700	
Regular (1)	1/2	12.7	16	406	48	1220	4	1840	900	
Regular (1)	1/2	12.7	24	610	96	2440	2	1840	900	
FIRECODE	3/8	9.5	16	406	48	1220	6	1440	700	

⁽¹⁾ Also available in Foil-Back.

METAL LATH

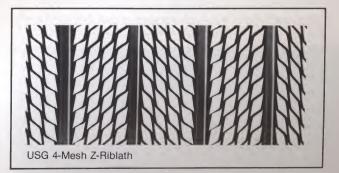
USG Metal Lath is sheet steel that has been slit and expanded to form a multitude of small mesh openings. Comes in Diamond Mesh and Riblath types and in various weights. Manufactured from galvanized steel, or cold-rolled steel further protected by black asphaltum paint. Comply with Fed. Spec. QQ-L-101C.



USG Junior Diamond Mesh Lath is a small diamond mesh metal plaster base (approx. 11,000 meshes per sq. yd.), a general all-purpose lath, best for ornamental, contour plastering. The small meshes conserve plaster and reduce droppings.

Also available in self-furring type having ¼" "dimple" indentations spaced 1½" o.c. each way for use as exterior stucco base, column fireproofing and for replastering over old surfaces.

Paper-backed type has asphalt-impregnated paper factory-bonded to the back. Ideal lath for machine-applied stucco in curtain walls and portland cement plaster setting bed for ceramic tile. Paper conforms to Federal Specification UU-B-790a, Type I, Grade D, Style 2.

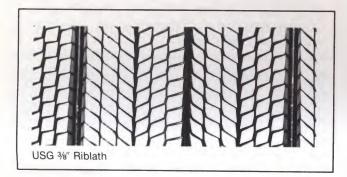


USG 4-Mesh Z-Riblath is a "flat rib" type of lath with smaller mesh openings, suitable for "double-up" type of plastering. An excellent nail-on lath, or for tie-on work on flat ceilings.

Specifications—USG Metal Lath

			Si	ze			packag	ing (bundle)			
	approx. wt.		finish		width		length		color		quantity	
product	lb/yd²	kg/m²	paint	galv.	in	mm	in	m	code	pcs	yd²	m²
Diam. Mesh - Regular	2.5 3.4	1.4 1.8	X X	X X	27 27	686	96 96	2.4 2.4	White Red	10 10	20 20	16.7 16.7
- Self-Furring	2.5 3.4	1.4 1.8	X X	X X	27 27	686 686	96 96	2.4 2.4	White Red	5 5	10 10	8.4 8.4
- Asphalt Paper-backed	2.5 (1) 3.4 (1)	1.4 1.8	X X	X X	27 27	686 686	96 96	2.4 2.4	White Red	10 10	20 20	16.7 16.7
%" (9.5mm) Riblath	3.4	1.8	Х	х	27	686	96	2.4	Red	10	20	16.7
4-Mesh Z-Riblath	2.75 3.4	1.5 1.8	X X		27 27	686 686	96 96	2.4 2.4	White Red	10 10	20 20	16.7 16.7

⁽¹⁾ Add 0.3 lbs/yd for weight of paper.



USG %" Riblath comes in a herringbone mesh pattern with %" V-shaped ribs running lengthwise of the sheet at 4½" intervals, with inverted intermediate 3/16" ribs. The heavy ribs provide exceptional rigidity. Used when supports are spaced not more than 24" o.c. and for 2" solid studless metal lath and plaster partitions. Also used as a centering lath for concrete floor and roof slabs.

Casing bead installed as plaster ground on diamond mesh lath and cold-rolled channel gridwork in decorative ceiling element.

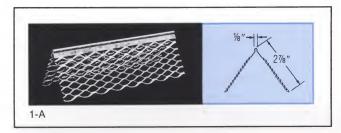




Lath and channel gridwork forms a base for basecoat plaster that conceals a column (above) and gauged-lime finish (below).



CORNER BEADS



1-A Expanded Corner Bead has 2%" wide expanded flanges that are easily flexed. Preferred for irregular corners. Provides increased reinforcement close to nose of bead.



X-2 Corner Bead has full 31/4" flanges easily adjusted for plaster depth on columns. Ideal for finishing corners of structural tile and rough masonry. Has perforated stiffening ribs along expanded flange.

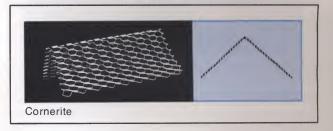


4-A Flexible Corner Bead is an economical general purpose bead. By snipping flanges, this bead may be bent to any curved design (for archways, telephone niches, etc.).



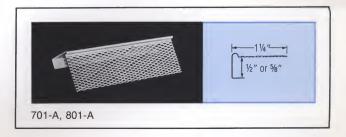
800 Corner Bead gives 1/16" grounds needed for one-coat veneer finishes. Approx. 90 keys per lin. in. provide superior bonding and strong, secure corners. The 11/4" fine-mesh flange eliminates shadowing, is easily nailed or stapled.

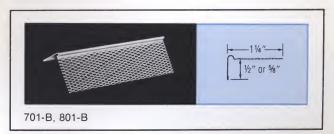
900 Corner Bead is used with two-coat veneer systems, gives $^{3}/_{32}$ " grounds. Its $1\frac{1}{4}$ " fine-mesh flange can be either stapled or nailed. Provides superior plaster key and eliminates shadowing.



Cornerite and Striplath are strips of Diamond Mesh Lath used as reinforcement. Cornerite is bent lengthwise in the center to form a 100° angle. It should be used in all interior angles where metal lath is not lapped or carried around, over non-ferrous lath anchored to the lath, and over internal angles of masonry constructions to reduce plaster cracking. Striplath is a similar flat strip, used as a plaster reinforcement over joints of non-metallic lathing bases and where dissimilar bases join; also to span pipe chases.

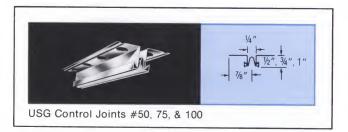
METAL TRIM



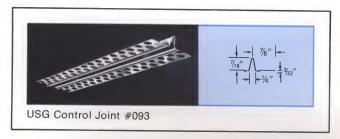


USG Metal Trim comes in two styles and two grounds to provide neat edge protection for veneer finishing at cased openings and ceiling or wall intersections. All have finemesh expanded flanges to strengthen plaster bond and eliminate shadowing. **No. 701-A**, channel-type, **No. 701-B**, angle edge trim, provide ³/₃₂" grounds for two-coat systems. **No. 801-A**, channel-type, and **No. 801-B**, angle edge trim, provide ¹/₁₆" grounds for one-coat systems. Sizes for ½" and %" IMPERIAL Gypsum Base.

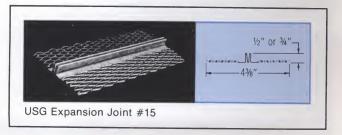
CONTROL JOINTS



USG Control Joint relieves stresses of expansion and contraction in large plastered areas. Made from roll-formed zinc, it is resistant to corrosion in both interior and exterior uses with gypsum or portland cement plaster. An open slot, 1/4" wide and 1/2" deep, is protected with plastic tape which is removed after plastering is completed. The perforated short flanges are wire-tied to metal lath, screwed or stapled to gypsum lath. Thus the plaster is key-locked to the control joint, which not only provides plastering grounds but can also be used to create decorative panel designs. Limitations: Where sound and/or fire ratings are prime considerations, adequate protection must be provided behind the control joint. USG Control Joints should not be used with magnesium oxychloride cement stuccos or stuccos containing calcium additives. Sizes and grounds: No. 50, 1/2"; No. 75, 3/4"; No. 100, 1" (for exterior stucco curtain walls).

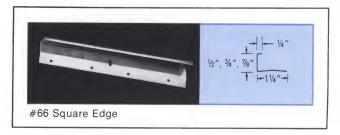


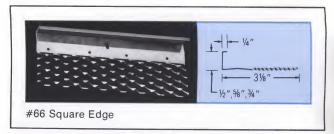
USG Control Joint No. 093 applies the same functions of the regular control joint to veneer finish installations. Made of zinc, with ³/₃₂" ground dimension and tape-protected ½" opening ⁷/₁₆" deep. Used from floor to ceiling in long partition runs, and from header to ceiling above door frames.



No. 15 Expansion Joint provides stress relief to control cracking in large plastered areas. Made with expanded flanges of galvanized steel or zinc in ½" and ¾" grounds.

CASING BEADS





USG Casing Beads are used as a plaster stop and as exposed trim around window and door openings; also recommended at junction or intersection of plaster and other wall or ceiling finishes. May be used with USG Metal Lath, ROCKLATH Plaster Base, or masonry construction. In order to insure proper grounds for plastering, 34" casing beads are recommended for use with metal lath, 58" beads with all masonry units, 76" beads when the flange is applied under ROCKLATH Plaster Base, 1/2" beads when the flange is applied over ROCKLATH Base. Available in #66 Square Edge with 11/4" solid flange in 1/2", 34" and 76" sizes. Expanded type with 31/6" flanges comes in 1/2", 5%" and 34" beads. Made from galvanized steel or zinc alloy for exterior applications.

USG Control Joint applies easily with staples.



Specificati	ons-Trim	Accessories
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		depth or	grounds	flange	width			length (1))	pcs.	approx. weight	
product		in	mm	in	mm	finish	7′	8′	10'	per ctn.	lb/1000 ft	kg/100m
USG 1-A Expande Corner Bead (2)	d			27/8	73.0	Galv.		Х	Х	40 30	195 195	29 29
USG X-2 Corner Bead				31/4	82.6	Galv.		Х	Х	40 30	253	38 38
USG 4-A Flexible Corner Bead				1½	38.1	Galv.		Х	Х	30	179	27
Expanded Flange (No. 800 No. 900	Corner Bea	ad 1/16 3/32	1.6 2.4	11/4 11/4	31.8 31.8	Galv. Galv.		X X	X X	60 60	83 90	12 13
USG Cornerite				2 3	50.8 76.2	Paint or Galv. Paint or Galv.		X X		75 75	90 132	13 20
USG Striplath				4 (Reg.) 6 (Reg.)	101.6 152.4	Paint Paint		X X		75 75	90 132	13 20
USG Metal Trim Channel Type No. 701-A	½" %"	³ / ₃₂ ³ / ₃₂	2.4	11/4 11/4	31.8 31.8	Galv. Galv.	X X		X X	50 50	98 106	15 16
Angle Type No. 701-B	½" %"	3/ ₃₂ 3/ ₃₂	2.4 2.4	1½ 1½	31.8 31.8	Galv. Galv.			X X	50 50	74 80	11 12
Channel Type No. 801-A	½" 5/8"	1/16 1/16	1.6 1.6	11/4 11/4	31.8 31.8	Galv. Galv.		X X	X X	50 50	95 103	14 15
Angle Type	1/2" 5/8"	1/16	1.6 1.6	1¼ 1¼	31.8 31.8	Galv. Galv.		X X	X	50 50	71 77	11 11
USG Control Joint	#50 #75 #100 #093	1/2 3/4 1 3/32	12.7 19.1 25.4 2.4	3/4 3/4 3/4 3/4	19.1 19.1 19.1 19.1	Zinc Alloy Zinc Alloy Zinc Alloy Zinc Alloy			X X X	25 25 25 25 25	172 192 216 115	26 29 32 17
#15 Expansion Joint		1/2 3/4	12.7 19.1	2 2	50.8 50.8	Galv. Galv.			X X	24 24	308 379	46 56
USG #66 Square Expanded Flange Casing Bead (2)	Edge	1/2 5/8 3/4	12.7 15.9 19.1	31/8 31/8 31/8	79.4 79.4 79.4	Galv. Galv. Galv.	Х	X X	X X X	8'-40,10'-30 30 7',8'-40,10'-30	213 241 255	32 36 38
USG #66 Square Short Flange Casing Bead	e Edge	1/2 3/4 7/8	12.7 19.1 22.2	1¼ 1¼ 1¼	31.7 31.7 31.7	Galv. Galv. Galv.			X X X	30 30 30	178 202 212	26 30 32

⁽¹⁾ Metric lengths: 7=2.1m, 8=2.4m, 10=3.0m. (2) Available in zinc, special order only.

JOINT TAPES

IMPERIAL Tape is a strong, glass-fiber, open-weave tape designed to reinforce joints of IMPERIAL and USG R.H. Base prior to veneer finishing. Open weave of tape provides for excellent keying of plaster during plaster embedding; highly crack-resistant. Two types:

Type P with pressure-sensitive adhesive backing. Selected for quick, self-stick hand application; saves installation time and fastener cost.

Type S with plain back, fastened with staples. Lower in cost than Type P.

Available 2½" wide in 300-ft. rolls, 12 rolls per ctn. Approx. coverage: 370 lin. ft., tape per 1,000 sq. ft. gypsum base. *Note:* Glass fiber tape should not be used with joint compounds.

Steel trowel speeds wrinkle-free attachment of IMPERIAL Type P Tape.

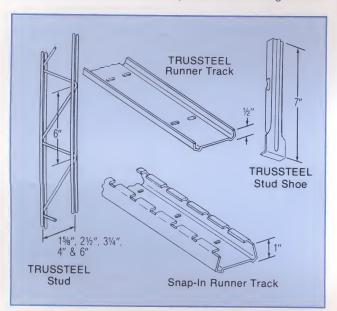


PERF-A-TAPE Reinforcing Tape is a strong, cross-fibered paper tape with minimal longitudinal stretch and superior tensile strength. Lightly pre-creased for corner application. Preferred for its consistent high performance with DURABOND Joint Compounds in veneer finishing under rapid drying job conditions.

Available nom. $2^{1}/_{16}$ " (52mm) wide in 60-ft., 250-ft., 500-ft. rolls. Approx. coverage: 370 lin. ft. tape per 1,000 sq. ft. gypsum base.

STRUCTURAL ACCESSORIES

U.S.G. leads the industry in the development and acceptance of structural components for plastering systems. Included are non-load bearing studs of the truss and channel types, runner tracks, shoes and screws as needed; furring and lathing channels, and an adjustable wall furring bracket.

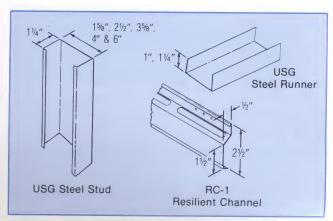


TRUSSTEEL Studs are used for framing hollow, fire-resistant partitions. They are formed from cold-drawn 7-ga. steel wire rods with tensile strength of 90,000 psi. A continuous diagonal wire web is welded to double wire flanges to provide an open-web design that readily accommodates pipes, conduits and ducts without impairing the partition's strength. Fabricated in five studs widths: 15%", 2½", 3¼", 4" and 6, factory-cut to job lengths.

TRUSSTEEL Snap-In Runner Track anchors the partition, permits stud to snap into place eliminating the need for stud shoes. When this track serves as a ceiling runner, stud shoes are used if a fire rating is required. Available for all except 6" width of studs; 10-ft. lengths.

TRUSSTEEL Runner Track is used with TRUSSTEEL Stud Shoes to anchor the partition at floor and ceiling, particularly where floor-to-ceiling height varies. Available for all stud widths; 10-ft. lengths.

TRUSSTEEL Stud Shoes, 7" long and made from 24-ga. steel, are used to connect studs to runner track. Permit up to 4" adjustment in partition height.



USG Steel Studs and Runners, channel-type and roll-formed from corrosion-resistant steel, are used in non-load bearing interior partition and exterior curtain wall systems. The secure, rigid screw or clip attachment of the gypsum base utilizes the full structural contribution of the lath and plaster membrane. Limited chaseways are provided by punchouts in the web. Assemblies using these studs are low in cost with excellent sound and fire-resistance characteristics. Available in various styles, and widths to meet functional requirements outlined below:

Interior Partitions, Ceilings, Column Fireproofing—ST and CWS stud styles in five widths—15/8", 21/2", 35/8", 4", 6"—and 8 to 16-ft. lengths. Runners in stud widths, 10-ft, length.

Exterior Curtain Walls—Studs are available in various styles to meet height requirements and in six widths—2½", 3½", 35%", 4", 5½", 6"—lengths up to 28 ft. Runners in stud widths (with 1¼" unhemmed leg), 10-ft. length.

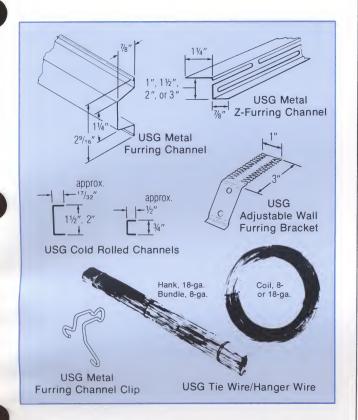
Load-bearing Construction—Studs are available in two styles for framing load-bearing interior and exterior walls and non-load-bearing exterior curtain walls. SJ style, with stiffened flanges, comes in 3½", 35%", 4", 6", 8" sizes and CS style in 3½", 35%", 4", 6" sizes with unstiffened flanges and less load capacity for greater economy in selecting members. Factory-cut in lengths up to 30 ft. Runners in stud widths (with 1" or 1¼" unhemmed legs,) 10-ft. length.

For complete data on USG Steel Studs and Runners see Steel Framing Components Catalog, CS-13.

USG Cold Rolled Channels are roll-formed 16-ga. steel, galvanized or black asphaltum painted; used for furring, suspended ceilings, partitions, ornamental lathing. **Sizes:** 34", 1½", 2"; 10, 16 and 20-ft. length.

WSG Metal Furring Channels are hat-shaped, ceiling and wall channels roll-formed from two gauges of galvanized steel. DWC-25 for screw attachment of ROCKLATH and IMPERIAL Bases. DWC-20 for greater spans and load-carrying capacity. Products comply with ASTM C645.

Structural Accessories



USG Furring Channel Clips, made of galvanized wire, are used in attaching USG Metal Furring Channels to 1½" cold-rolled channel ceiling gridwork.

RC-1 Resilient Channel is a galvanized steel channel for resilient attachment of IMPERIAL and USG R.H. Bases to wood framing. One of the most effective, lowest-cost methods for improving sound control. Flange is prepunched for screw fastening to wood framing. Base is screw-attached to channel.

USG Z-Furring Channel is used to attach mineral-fiber and FOAMULAR polystyrene insulations and IMPERIAL Base to interior of exterior masonry walls. Made of hot-dip galvanized steel. Suitable for 1" to 3" thick insulation.

USG Adjustable Wall Furring Brackets are used to attach framing to interior of exterior masonry walls in braced furring systems. Made of 20-ga. galvanized steel and attached to steel studs or horizontal channel stiffeners. Furring depth: up to $2\frac{1}{4}$ " plus stud width.

USG Tie Wire—18-ga. galvanized soft annealed wire for tying metal lath to channels and furring to runner channels; also 8-ga. **Hanger Wire** for suspended ceiling channel runners when spaced not more than 4 ft. o.c.



Structural/Lath Attachment Accessories

Specifications—Structural Accessories

			size	le	ngths			W	eight	
product		in	in mm		m	shipping unit	unit Ib kg		lb/1000 ft	kg/100 m
TRUSSTEEL Studs	(1) (1) (1) (1)	15/8 21/2 31/4 4 6	41.3 63.5 82.6 101.6 152.4		ade to Order	10 pc			440 455 470 485 515	65 68 70 72 77
TRUSSTEEL Snap-In Runner Track	(2) (2) (2) (2)	15/8 21/2 31/4 4	41.3 63.5 82.6 101.6	10	3.05	10 pc	30 36 42 47	14 16 19 21	295 355 415 470	44 53 62 70
TRUSSTEEL Runner Track	(2) (2) (2) (2) (2)	1% 2½ 3¼ 4 6	41.3 63.5 82.6 101.6 152.4	10	3.05	10 pc	20 27 33 38 53	9 12 15 17 24	200 265 325 375 525	30 39 48 56 78
TRUSSTEEL Stud Shoes	(2)	24 ga	0.6	_		500 pc	40	18	_	_
USG Cold-rolled Channel	(1) & (2)	3/4	19.1	10,16,20	3.05, 4.88, 6.10	20 pc	60,96,120	27,44,54	300	45
		11/2	38.1	10,16,20	3.05,4.88,6.10	10 pc	50,80,100	23,36,45	500	74
	(1)	2	50.9	16	4.88	10 pc	101	46	629	94
USG Furring Channel DWC-25 DWC-20	(2) (2)	25 ga 20 ga	0.5 0.9	12 12	3.66 3.66	10 pc 10 pc	34 62	15 28	285 515	42 77
JSG Furring Channel Clips	(2)	11/2	38.1	_	_	500 pc	20	9	_	_
RC-1 Resilient Channel	(2)	½x2½	12.7x63.5	12	3.66	20 pc	48	22	200	30
JSG Z-Furring Channel	(2) (2) (2) (2)	1 1½ 2 3	25.4 38.1 50.8 76.2	81/2	2.59	25 pc	49 57 66 85	22 26 30 39	225 270 315 400	33 40 41 60
JSG Adj. Furring Bracket	(2)	20 ga	0.9	_	_	500 pc	29	13	_	_
USG Tie Wire/Hanger Wire	(2) (2) (2)	18 ga 18 ga 8 ga	1.2 1.2 4.2	8310 4 730	1533 1.22 223	Coil Hank (4128 ft) Coil	50 25 50	23 11 23	_	

Notes: (1) Painted; (2) Galvanized.

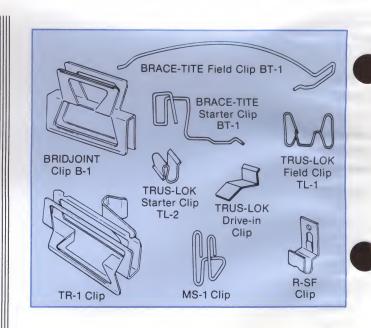
USG LATH ATTACHMENT ACCESSORIES

A complete line of specially formed steel clips and self-drilling steel screws provides positive attachment and rapid erection of gypsum plaster bases and metal lath. Variations are used with different U.S.G. partition and ceiling systems.

BRIDJOINT Field Clip B-1 is used to support and align end joints of lath which do not fall opposite members; for %" lath.

BRACE-TITE Field Clip BT-1 is used for suspended ceilings, exterior wall and beam furring and hollow pipe chase partitions. Provides support across full width of lath. For use with standard 3/4" cold-rolled channels spaced 16" o.c.

BRACE-TITE Starter Clip BT-1 is used in conjunction with BT-1 field clip to start first course of lath.



TRUS-LOK Field Clip TL-1 is a wire clip designed for attaching %" ROCKLATH Plaster Base to TRUSSTEEL Studs.

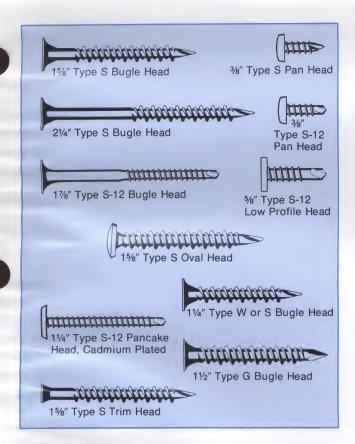
TRUS-LOK Starter Clip TL-2 is used with TL-1 clips, MS-1 clips and runner track to start first course of lath.

TRUS-LOK Drive-In Clip is used to anchor (1) bottom course of lath in direct attachment to TRUSSTEEL Studs, and (2) top course of lath in partitions to underside of monolithic concrete flat slab or concrete joist filler construction; also as starter-finisher clip in Steel Stud-ROCKLATH Plaster Base Partition.

MS-1 Clip, a wire clip, provides quick direct attachment of %" ROCKLATH Base to channel-type USG Steel Studs. Clip is slipped behind stud flange and down over lath.

Resilient Clip TR-1 attaches %" ROCKLATH Base to TRUSSTEEL Studs spaced 16" o.c., furs lath %" from stud face.

Resilient Starter-Finisher Clip R-SF is used with starting and last courses of resiliently attached ROCKLATH Plaster Base on wood studs or TRUSSTEEL Snap-in Runner Track.



USG Screws are recommended for mechanical attachment of large size IMPERIAL and USG R.H. Bases, as well as, ROCKLATH Plaster Base in many applications. A complete line of special self-drilling, self-tapping steel screws is available including types with a double-thread design which



Clip-attached ROCKLATH Plaster Base provides a superior surface for basecoat plaster.

produce up to 30% faster penetration, less screw stripping, and greater holding power than conventional fasteners. Screws are highly corrosion-resistant and applied by power-driven screwgun. In exterior curtain walls, specify cadmium-plated screws. They comply with ASTM C646. Applications are listed below.

USG Screws

oirea 9 hans	fastening applications
sizes & type	V
1", 15/16" and 15%" Type S—Bugle Head	Single and double-layer IMPERIAL Base and ROCKLATH Base to steel studs, metal furring; (1" screw only) IMPERIAL and USG R.H. Bases to RC-1 Resilient Channel
1¼", 1%", 2¼" & 2%" Type S—Bugle Head	Core units and face-layer IMPERIAL Base to steel runners in caged beam fireproofing
1", 1¼", 1%", 1%", 2", 2%", 2%" and 3" Type S-12—Bugle Head	Gypsum sheathing and IMPERIAL Base to steel studs in curtain wall assemblies
1¼" Type S-12— Pancake Head, cadmium-plated	Metal lath and brick ties over gypsum sheathing to steel framing in curtain wall assemblies
1", 1%" & 2¼" Type S and S-12 —Trim Head	Wood trim over single and double-layer IMPERIAL Base to steel studs and runners
%" Type S— Pan Head	Steel studs to steel runners
%", ½" Type S-12— Pan Head	Steel studs to runners, metal door frame
%" Type S-12—Low- profile Head	Steel-to-steel attachment up to 14-ga. in curtain walls and steel framing systems
1¼", 1%", 2¼" Type S—Oval Head	Cabinets to steel studs and RC-1 Resilient Channel
1¼" Type W or S— Bugle Head	Single-layer IMPERIAL and USG R.H. Bases to wood framing; RC-1 Channels to wood framing
1½" Type G— Bugle Head	Face-layer IMPERIAL Base to base-layer IMPERIAL Base in laminated partitions



Specially colored and textured interior stucco, applied over metal lath, forms an attractive, durable surface on courtyard walls, spandrels and columns.

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